

Models Gauge Course of Argo Oil Spill

By John P. Hebert
Of the CW Staff

WASHINGTON, D.C. — Eight days after the oil tanker Argo Merchant became grounded off Nantucket Island on Dec. 15, computer simulations predicted less than a 5% chance that oil would foul New England beaches.

The U.S. Geological Survey and the Coast Guard rushed waiting computer models into operation to gauge the risks posed by the almost eight million gallons of industrial-weight oil carried by the Liberian-registered tanker.

Although the immediate danger has passed, the Survey, based in Reston, Va., is still using a model to predict the course and direction of the four to six million gallons of oil which leaked from the

vessel when it broke up in stormy seas several days after it was grounded.

That model, originally developed to perform a worst-case oil spill risk analysis, was first run last September and October [CW, Oct. 25].

Three-Hour Updates

Using its dual IBM 370/155 CPUs, the Survey updates the model every three hours with fresh data on wind speed and direction from the U.S. Weather Service, according to Dick Smith, who heads the Survey's simulation effort.

The modelers use this updated information as a starting point in the simulation. "This improves the estimate of probability on the direction and speed of the spill, determining where it will go and

when," Smith explained.

Survey personnel are also attempting to make extended predictions by estimating from the model how far from the wreck the main portion of the oil slick will be dispersed in 60-day periods.

"We estimate this main body of oil will be spread out over a 90-mile diameter area by the end of January and will increase to a 150-mile diameter patch by the end of February," Smith said.

The chance that oil will come ashore in the U.S. has diminished to "much less than 5%," he said. Smith did expect it to come ashore, however, in the British Isles or northern Europe, but warned that was only conjecture because there are no models covering the area east of Nova Scotia.

(Continued on Page 6)

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper

Second-class postage paid at Boston, Mass., and additional mailing offices

© 1977 by Computerworld, Inc.

Price: \$15/year

January 17, 1977

Vol. XI, No. 3

HIS Tops Off Level 6 Family

By Esther Surden
Of the CW Staff

BILLERICA, Mass. — The Model 6/43 introduced by Honeywell Information Systems, Inc. (HIS) here last week is the firm's top-of-the-line entry in its Series 60 Level 6 family.

Available in two memory versions, the system is said to be 30% to 60% faster than the 6/36 introduced last year; its performance range is comparable to that of Digital Equipment Corp.'s PDP-11/45 and the Data General Corp. Eclipse C/230, HIS claimed.

Designed for use in commercial and scientific applications by both end users and OEMs, the 6/43 is built around a single Megabus, as is the 6/36.

The 6/43 CPU can directly address 1M words of memory supported by 28 20-bit-long registers. The Megabus design provides 64 vectored interrupts and 20 traps for identifying system and program error conditions. The Megabus cycle time is 300 nsec, HIS said.

Users can optionally obtain memory management hardware which provides segmentation, read/write execute protection, base sector relocation and other functions.

Two Types of Memory

Two kinds of memory are available for the 6/43 — the NMOS single-word access version previously available on the Level 6 and an NMOS double word-access 32-bit version.

The 32-bit memory and controller provide users with the performance advantages of a 32-bit machine without the cost that goes along with following 32-bit technology throughout the machine, according to a spokesman. The memory's controller fetches two words at a time automatically in response to the CPU, he added.

A Scientific Instruction Processor (SIP) is also optionally available with the system. The SIP floating-point processor plugs directly into the Megabus and allows the 6/43 with the double word-access memory to run Fortran programs three times faster than the 6/36, the firm said.

The SIP provides 30 scientific instructions and performs either single- or double-precision arithmetic, the company explained.

As part of software enhancements to make the system more end user-oriented,

(Continued on Page 4)

Katzenbach, Justice in Huddle

IBM Antitrust Settlement in the Wind?

By E. Drake Lundell Jr.
Of the CW Staff

WASHINGTON, D.C. — A top IBM official huddled with the head of the Antitrust Division of the Justice Department here last week, apparently seeking to outline terms that might lead to a settlement of the government's eight-year-old antitrust suit against the firm.

At the same time the secret meeting was held, the four Cabinet appointees with IBM connections began undergoing questioning by the Senate on their qualifications for Cabinet posts.

The meeting, confirmed by Justice Department officials, was between Nicholas deB. Katzenbach, vice-president and general counsel for IBM, and Donald Baker, head of the Antitrust Division.

Held at the request of Katzenbach, the meeting was described by Justice Department sources as "a courtesy call" in which Katzenbach outlined IBM's position on the case to Baker and discussed its status as well as the present shape of the computer industry.

The sources did not say whether specific settlement terms were proposed or discussed.

While the discussion was probably of a general nature, sources here indicated most

out-of-court settlements of antitrust cases usually begin with such discussion.

Although the meeting was described as a courtesy call to get acquainted with Justice

The Justice Department may have found a successor to Raymond Carlson, the attorney heading the prosecution team in U.S. vs. IBM. See story on Page 4.

officials, sources noted that Baker had been in charge of the division for over six months and that if Katzenbach had just wanted to drop by to say hello, he could have done so

earlier.

By describing IBM's view of the case and its probable outcome, Katzenbach probably outlined what IBM would like to see in any possible consent decree or out-of-court agreement, even if not in so many terms, the sources added.

This will allow Baker, who is reportedly staying on as head of the division until at least next summer under the Carter Administration, to be able to pass the word along to Attorney General-designate Grif-

(Continued on Page 4)

Florida Kills Tax on Software, Rules DP Programs 'Intangible'

By Nancy French
Of the CW Staff

MIAMI — The taxation of computer software as tangible personal property in this state was struck down by an administrative court here last month, largely on constitutional grounds.

In a case brought by Nova Computing Services, Inc. against Gov. Reubin O. Askew et al, the Florida Division of Ad-

ministrative Hearings ruled Nova Computing sells "services" to its customers which are exempt from sales tax.

The only tangible personal property involved in the sale is the tape and cards that contain the data.

These goods are inconsequential to the sale because the information they contain could also be transmitted "orally or electronically without any tangible manifestation of transmission," according to the decision.

The consequential element involved in such transactions is data which is defined as intangible property and, therefore, not subject to the tax, Hearing Officer K.N. Ayers ruled.

In the suit, Nova Computing was fighting the state's right to assess it \$26,225.67 in software sales tax which the firm should have collected between January 1973 and Nov. 30, 1975 [CW, Nov. 15].

Many states have been taxing software and data entry services under laws that authorize taxation of tangible personal property even though federal law considers such property intangible.

In the case of New York, state tax officials have decided to enforce a tax that would affect users and software vendors retroactively [CW, Nov. 15].

In Florida, taxes were assessed on the value of the entire sale of a software package or service even though the only property that could be identified as tangible in such transactions was the punched cards

(Continued on Page 2)

NCR Mini, Micro Among Debuts Made on NRMA Convention Floor

By Toni Wiseman
Of the CW Staff

NEW YORK — Conference goers at the National Retail Merchants Association's (NRMA) annual convention here last week were treated to a look at a wide range of new point-of-sale products on the convention floor.

NCR was on hand with two system introductions and an upgrade to its operating software. The 8250 minicomputer system is NCR's latest offering and its first step into 19-in. rack-mounted peripherals.

Up to 128K bytes of memory and 20 million bytes of disk storage can be installed in a single highboy cabinet along with the processor, a magnetic tape cassette drive and interfacing logic for peripherals and terminals.

The 8250, with its MOS memory, can also run a remote batch communications application concurrently with interactive or batch applications in a multiprogramming environment, the vendor said.

Optional features include printers with speeds of up to 600 line/min, a second in-

NRMA coverage continues on Page 8.

grated disk controller, magnetic tape handler and single and dual flexible disk drives.

A standard configuration with 48K bytes of memory, 1 million bytes of disk, a 55 line/min matrix printer and one CRT costs \$42,500 or \$1,175/mo on full service rental.

NCR's 7200 Model VI is a free-standing desktop microcomputer programmed in

(Continued on Page 7)



EDITORIAL

Editor	E. Drake Lundell Jr.
Deputy Editor	Ronald A. Frank
Managing Editor	Nancy French
Associate Editor	Donald Leavitt
Associate Editor	Esther Surden
Associate Editor	Molly Upton
Computer Industry Editor	Toni Wiseman
Staff Writers	Catherine Arnst John P. Hebert Edith Holmes
Chief Copy Editor	Cheryl M. Gelb
Copy Editors	Bobbi C. Sternheim Barbara T. VanScoyoc
Photography Editor	Ann Dooley
Editorial Assistant	Denise Petski
Editorial Cartoonist	Jim Orton
Bureaus:	
London	Roger R. Frampton
Munich	Dr. Gerhard Maurer
Asia	Hidetsuna Sasaki
Contributors:	
Education	J. Daniel Couger
Legal	Roy N. Freed
Taylor Reports	Alan Taylor
Contributing Editor	Edward J. Bride

SALES

Vice President/Marketing	Roy Einreinhofer
Advertising Administrator	Judy Milford
Display Advertising	Sara Steets
Classified Advertising	Pam Palmer
Recruitment Advertising	Kathy Steinberg
Sales Promotion Director	Jack Edmonston
Market Research	Kathryn V. Dinneen

CIRCULATION

Vice-President/Circulation	Margaret Phelan
Circulation Manager	Barbara Jeannetti

PRODUCTION

Manager	Lee Vidmer
Supervisor	Henry Fling
Assistant Manager	Peter Holm

Please address all correspondence to the appropriate department at 797 Washington Street, Newton, Mass. 02160. Phone: (617) 965-5800. Telex: 92-2529.

OTHER EDITORIAL OFFICES: England: Computerworld Publishing Ltd., 140-146 Camden Street, London NW1 9PF. Phone: (01) 485-2248/9; Telex: 264737. **W. Germany:** Computerworld, c/o Computerwoche GmbH, 8000 Munchen 40, Tristanstrasse 11. Phone: 36-40-36/37. Telex: 5215350. **Asia:** Computerworld, c/o Dempa/Computerworld Company, Dempa Building, 1-11-15, Higashi Gotanda 1-chome, Shinagawa-ku, Tokyo 141. Phone: (03) 445-6101. Telex: 26792.

Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except: a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160. Copyright 1977 by Computerworld, Inc. All rights reserved.

50 cents a copy; \$15 a year in the U.S.; \$23 a year for Canada and PUAS; all other foreign, \$40 a year. Four weeks notice required for change of address. Please allow six weeks for new subscription service to begin.

Reproduction of material appearing in *Computerworld* is strictly forbidden without written permission. Send all requests to Walter Boyd.

Computerworld can be purchased on 35 mm microfilm in half-volumes (six-month periods) through University Microfilm. Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700.

COMPUTERWORLD, INC.

Board Chairman/Publisher	Patrick J. McGovern
President	W. Walter Boyd
VP-Marketing	Roy Einreinhofer
VP-Finance	William P. Murphy
VP-Circulation	Margaret Phelan



ABP

MCC
MEDIA DATA FORM

POSTMASTER: Send Form 3579 (Change of Address) to Computerworld Circulation Dept., 797 Washington St., Newton, Massachusetts 02160.

AT&T Takes Waddy Ruling to High Court

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. — AT&T has asked the U.S. Supreme Court to review a lower court decision confirming the U.S. District Court's jurisdictional authority to hear the Justice Department's antitrust case against the Bell System.

The petition for review by the high court could introduce new delays into the two-year-old suit for two reasons.

First, Supreme Court cases of this type are normally handled by the U.S. Solicitor General, an office that to date has not been involved in the case.

Second, the person who will head that office has yet to be appointed by President-elect Jimmy Carter.

Late last year, Judge Joseph Waddy ruled the U.S. District Court had jurisdiction over the suit after this issue had first been raised by AT&T [CW, Dec. 13].

Waddy's ruling was handed down after careful consideration of whether the Federal Communications Commission or the U.S. courts should hear the antitrust suit.

Also considered was whether Waddy's court in the District of Columbia or the U.S. District Court in New Jersey (which heard the 1956 AT&T antitrust suit) should hear the case.

In asking for Supreme Court review, AT&T estimated the case will include a 10-year discovery period; would be "the most massive undertaking in the history of the American judicial system"; and could cost the Bell System and the government "in excess of \$1 billion."

"These costs would be borne ultimately by the telephone consumer and the taxpayer, one and the same person," according to an AT&T spokesman.

Quick Review Unlikely

Although AT&T estimated the Supreme Court could give the petition for review expedited treatment and could resolve the issue by the end of its term in June, Washington legal sources last week considered this unlikely.

While an additional review would be considered "good judicial administration" at this point, one legal source said Waddy's opinion had not yet been ruled on in the U.S. Court of Appeals.

The high court could decide to await an appeals court review, he said.

Anticipating this legal problem, AT&T also filed its petition for review with the U.S. Court of Appeals for the District of Columbia.

Regardless of which court hears the

AT&T petition, the position of the Justice Department will be presented by the incoming Solicitor General.

During Senate confirmation hearings last week, Attorney General-designate Griffin B. Bell told the Senate Judiciary Committee he was prepared to name Judge Wade H. McCree Jr. to the Solicitor General post.

The Justice Department's exact arguments in regard to this petition "will depend on who the new Solicitor General will be," one legal source said.

Florida Kills Tax on Software

(Continued from Page 1)

or paper tape that changed hands.

This "tangible" property was admittedly worth only about 5% of the value of the transaction, state officials said at the hearing.

Oddly enough, in cases where programs or data entered directly into the computer via CRT terminals or where computer tapes were used instead of cards or paper tape and then returned to their owner in a "reusable" state, no sales tax was assessed.

This was one of the flaws in the state's tax logic that was attacked by Nova Computing's president, Robert Sherin, who drew his defense from cases ranging from *McCulloch vs. Maryland*, heard in 1819, to a 1976 ruling of the Tennessee Supreme Court.

The Florida Cabinet has until this week to appeal the ruling, but, according to Assistant Attorney General Patricia S. Turner, who represented the state at the hearing, "it would not be a wise decision to appeal."

In 1819, Chief Justice John Marshall rendered a historic opinion establishing the supremacy of federal law over state law and state law over state agency rulings, Sherin told the hearing officer.

"The Constitution and the laws made in pursuance thereof are supreme," according to Marshall's ruling," Sherin said. "They control the constitution and laws of the respective states and cannot be controlled by them."

The tax levied in Florida resulted in assessing Florida taxpayers for alleged tangible personal property "while depriving them of the benefits of electing to take a federal Investment Tax Credit and to depreciate their alleged tangible property" the way a firm could depreciate a building or a piece of equipment.

The reason for this is that the Federal Government "construes this property to be 'intangible' not 'tangible,'" Sherin added.

"Rulings in Florida cannot be inconsis-

It is highly unlikely the high court will get to the AT&T petition before the end of its current term in June. If this is so, the matter would not be heard until the Supreme Court reconvenes in October, the source explained.

In addition, industry sources last week said it would be almost impossible for the discovery phase of the Justice Department suit to begin in March, as both parties had hoped after Waddy's recent ruling [CW, Jan. 10].

tent with federal rulings," he said.

In his ruling, the hearing officer reasoned the keypunch service Sherin sold was actually a service much like that performed by a court reporter who records and transcribes the proceedings in a trial.

Ayers also referred to another software case — *Texas Instruments, Inc. vs. the U.S. government* — which established that the Internal Revenue Code limits the federal Investment Tax Credit to "tangible personal property."

Here the court held that Texas Instruments was not entitled to take a tax credit for information on magnetic tape regardless of the investment that created it because the investment was in the information the magnetic tape contained, not the tape, and information is intangible.

Ayers also cited *Commerce Union Bank vs. George M. Tidwell*, the commissioner of revenue for the State of Tennessee, which also involved the taxation of computer software as tangible personal property [CW, Nov. 15].

Tennessee law defines tangible personal property as property which may be seen, weighed, measured, felt or touched or is in any other manner perceptible to the senses, Ayers said.

Here the court distinguished between computer software and motion picture film or phonograph records which the court had previously determined were tangible personal property.

The difference, the court held, was that without the film or phonograph record there would be no movie or music.

By comparison, software can be transmitted orally or electronically without the tape or cards on which it is contained. It is merely incidental that these intangibles are transmitted by way of a tangible reel of tape.

Sherin's assessment of \$26,225.67 in software sales tax was also ordered expunged.

On the Inside This Week.

NEWS

DP Health Files More Secure Than Paper Records	5
DP Plotting Helps Coast Guard Search for Tanker	6
EFT Concepts Seen Evolving Into Reality in Next Decade	8
Calendar	12
MIT to Let Students 'Attend' DP Class Remotely	13
DP Helps Recruit, Place Physicians in Rural Areas	15

EDITORIAL

Editorial: The Carter Cabinet	16
Human Connection: Operations Staff Frustrated at Top	17
Taylor Report: Lack of Time Causes MIS Failures	17
Cryptography Urged as Practical Means of Security	18
FAA Air Traffic Control System: Rush to Automation?	19
Surprising Results Often Come From User's Guides	20

SOFTWARE & SERVICES

Users Put 38 Packages on Honor Roll	23
'Wylbur' Backs Both Interactive and RJE Operations	24
Software Physics Shows Managers What's Happening	25
Files Moved From Disk to Tape Under 'UCC Three'	26

COMMUNICATIONS

Daily Eager to Swap Dataspeeds for Less Costly CRTs	29
Event Counter Monitors Nets	30
Conversion System Eases Transmission	31

TERMINAL TRANSACTIONS

Trucker Opts for Net to Cope With Billing Paperwork	33
Delta Micro-Based CRT Designed for Variety of Nets	34
Retailer's Programmable Units Increase Efficiency	35

SYSTEMS & PERIPHERALS

Shop Can Cut Costs by Redesigning Business Forms	37
Move From IBM to Univac Saves for Texas Counties	38
User Cuts Time 20% With Memorex 3340-Type Disk	39
Smithfield Innovates With Third-Party Service	40

MINIWORLD

'Safer' Helps Blaze Paths to Flames	41
Small System Helps Dealers Control Inventory	42
Firm Combines Word, Data Processing	43
Plastics Firm Goes to Small System For Growth	44

COMPUTER INDUSTRY

IBM Bastion Was Xerox's Major Stumbling Block	45
Financial Analyst Predicts IBM Stock to Split	45
CA Files Antitrust Suit Against Datapoint, Others	46
Time-Sharing Seen Losing Ground as Service Choice	47
'Greater Good' Extraneous in Marketing	48



As the ICEMAN sort melteth, the number of SyncSort users increaseth!

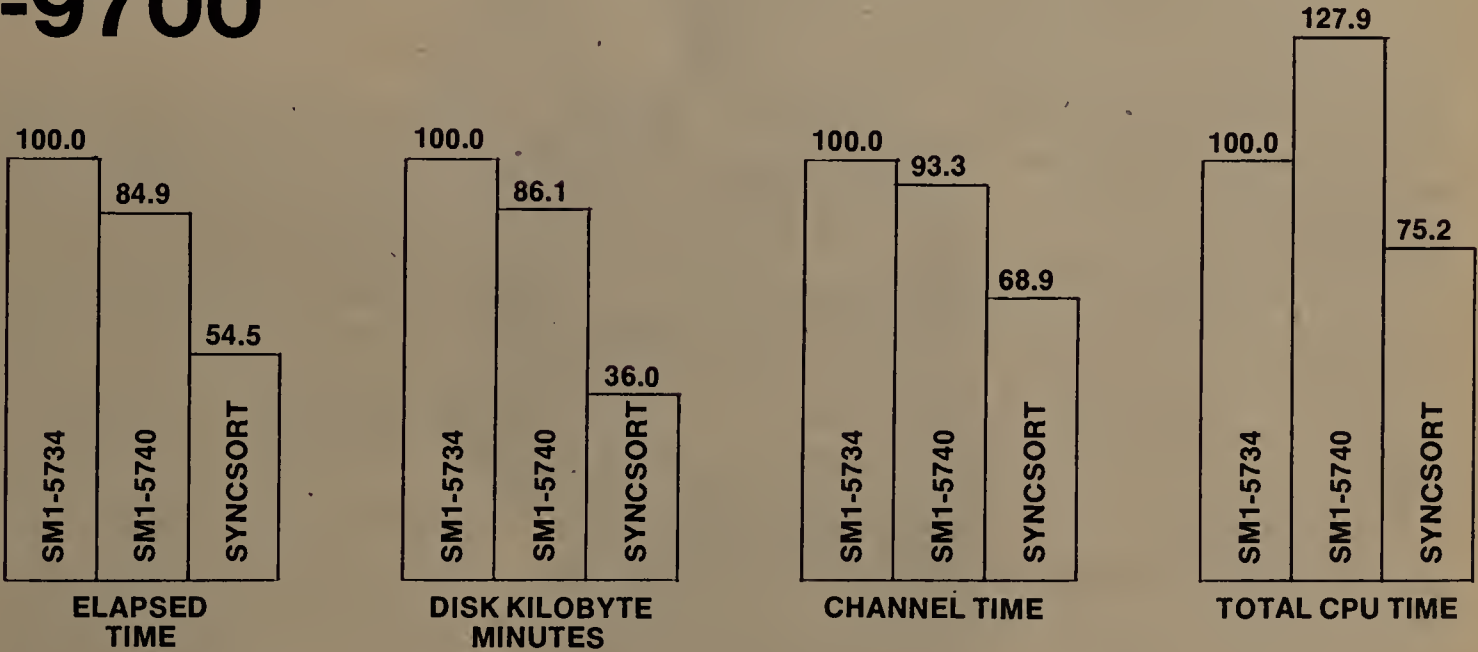
(IBM users, come in from the cold!)

Call (201) 568-9700

Get a warm
reception.

OVERSEAS REPRESENTATIVES —

Brussels: CAP/GEMINI/CES
Dusseldorf: CAP/GEMINI GmbH
Geneva: CAP/SOGETI
Hague: CAP-GEMINI/PANDATA
London: GEMINI Ltd.
Melbourne: Shell Oil Co. of Australia
Milan: SYNTAX
Paris: CAP/SOGETI PRODUITS
Sao Paulo: Deltacom do Brasil
Stockholm: BRA
Tel Aviv: ADVANCED TECHNOLOGY, Ltd.
Vienna: Ratio



Pity the poor ICEMAN! When IBM introduced its sort, it was frozen solid, its carrot nose glowed and the plug hat was cocked at a rakish angle.

Alas, it didn't stay that way long. Our SyncSort products continued to heat up the sorting climate and the ICE Age was soon history.

As we ran an increasing number of benchmark tests on users' files, pitting ICEMAN/PEER (SM1-5740) and IBM's other sort, SM1-5734, against our SyncSort III-and-half, it soon became obvious that it was no contest. The other sorts weren't in the same class with SyncSort.

Performance was the main reason. (And why else do you opt for any software product?) SyncSort III-and-half proved to be a real miser with machine resources. Pitted against the other two sorts, it will give you savings that look like this:

Sort Support was another reason. Users soon discovered that when they called us, a warm-blooded creature was at the other end of the line. When they called IBM, well ...

None of these obvious advantages of SyncSort were lost on previous IBM sort users. Consequently, we've been enjoying a very high rate of conversion to our product. (IBM should be so lucky in converting its hardware users to new operating systems.)

Is there hope for ICEMAN? Well, it's going to take a lot of cold weather. Maybe the Computer Giant will have to follow the practice used by certain ski-resort operators.

Call in an Indian tribe to hold a snow dance.



WHITLOW

COMPUTER SYSTEMS Inc. 560 Sylvan Ave., Englewood Cliffs, N.J. 07632

IBM, Justice Parley Sparks Talk of Suit Settlement

(Continued from Page 1)

fin Bell who, if he decides to settle the case, will know the IBM terms and conditions, the sources said.

The timing of the visit, with a new Administration coming in this week, was "very interesting," they noted. Spokesmen for Bell last week indicated

he, along with others, was "studying the case" that is currently being carried on by the department he will head if he is confirmed by the Senate as expected.

Settling the Case

In many ways, the new Administration would probably like to settle the suit in order to free manpower and funds devoted to the case for other projects, other sources noted.

An incoming administration, the sources said, does not receive much credit for finishing up a case that has been pursued by a previous administration. A new administration would probably prefer to devote its resources to cases of its own choosing.

This is particularly true when an incoming regime represents a different political party, they noted.

Presently, almost 10% of the Antitrust Division's resources are devoted to the IBM

case.

The U.S. suit against IBM was filed on the last working day of the Johnson Administration, eight years ago today. It has been pursued since then under the Republican administrations of Nixon and Ford.

IBM has often taken the position that the case is without factual basis and that it just penalizes the firm for being successful, ideas most likely emphasized by Katzenbach in his discussion with Baker.

In addition, the firm has noted the case is eight years old and claimed the industry has changed significantly over that time, obviating the need, if there ever was one, for the government action.

The industry is getting more competitive all the time, IBM claimed. It also has said its share of the market is declining — again making the government position out of date in the reality of today.

Asked about the meeting, an IBM spokesman said "we're not going to comment."

Senate Hearings

While that meeting was going on, the Senate began confirmation hearings on four Cabinet nominees with IBM ties.

The Senate heard testimony from Patricia Harris, an IBM director designated to be Secretary of Housing and Urban Development; Cyrus Vance, an IBM director nominated to be Secretary of State; and Harold Brown, an IBM director designated to be Secretary of Defense.

In addition, testimony was heard from Griffin Bell, the nominee for Attorney General who is a partner in the law firm of King and Spalding, a firm currently representing IBM on a "routine commercial matter" [CW, Dec. 27-Jan. 3].

HIS Extends Level 6 With Model 6/43

(Continued from Page 1)

HIS added the GCOS6/MDT disk-based operating system that is said to provide executive, file management and communications facilities in a multiprogramming environment.

The firm also announced a Level 62-compatible Report Program Generator for the Level 6 and reportedly enhanced its Cobol compiler to support Isam, 9-track magnetic tape and 120 char./sec printer activities.

Peripherals announced included 7- and 9-track, 45- and 75 in./sec magnetic tape units and a 120 char./sec printer. A 960-character, 12-line CRT with removable keyboard was also announced.

A typical 6/43 with 96K words of memory, SIP, 10M-byte cartridge disk, magnetic tape drive, 300 line/min printer, eight CRTs and the GCOS6/MDT program development software costs "less than \$80,000," HIS said. It will be available next month.

The GCOS6/MDT executive costs \$800; a sort capability for both the executive and the previously announced BES/2 operating system is priced at \$200. RPG costs \$2,200.

Prices for the magnetic tape devices begin at \$7,000 with the controller costing \$3,000. The printer is priced at \$2,750 while the CRT costs \$1,400, HIS said from 200 Smith St., Waltham, Mass. 02154.

Solving business problems is our business.

John D. deButts, Chairman of the Board, AT&T

You'll be seeing the phrase:
"The system is the solution."
It's more than a slogan. It's a basic expression of the Bell System's marketing philosophy.

The single fastest growing part of any business today is communications.

The flow of information.

So it is no wonder that many problems in business are really communications problems in disguise.

Communications can solve business problems.

At the Bell System, we believe we can be of enormous value to business—any business—by applying our expertise in communications to your business problems.

Not simply voice communications. But data as well. The Bell System is the largest data transmission network in the world. In short, total communications systems problem solving.

To solve your problems, we have to understand your problems.

No single person has the knowledge and experience to deal with the problems of every business.

So we have aligned our efforts on an industry-by-industry basis (i.e. automotive, hotel/motel, education, package goods, travel, etc.).

This way each division has an in-

depth understanding of the problems faced by its customers. The heart of each is an Account Representative who is assigned to you.

Your Account Representative thoroughly understands today's complex communications, and more importantly, understands your business thoroughly.

We take total responsibility.

Perhaps the single most important part of the Bell System's approach to problem solving is taking total responsibility for the design, supply, installation, maintenance and repair of your communications system.

A communications system designed and implemented by the Bell System is backed end to end by the Bell System.

Put the resources of the world's largest communications company to work for you.

No matter what business you're in. No matter where you're located. There are Bell System people ready to meet your needs.

Remember, if you have a problem:

The system is the solution.



Bell System



Model 6/43

In-Depth Privacy Study Concludes

DP Health Data Files More Secure Than Paper Records

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. — Computerized health records are more secure today than their counterparts in paper files, according to an in-depth study of privacy in medical recordkeeping and health care released here last week.

And record leaks or misuse of medical information occur largely in manual record systems because the most sensitive health data is still stored and transferred in paper files, the study found.

However, automated systems in the health care field are far from trouble-free. Health data systems are being created today that many health professionals, citizen groups and individuals affected by such systems consider to be threats to basic rights, the report said.

Sponsored by the National Bureau of Standards (NBS) Institute for Computer Sciences and Technology, the two-year study was directed by Alan F. Westin, professor of public law and government at Columbia University.

Timely Study

From Westin's viewpoint, the 401-page report, entitled "Computers, Health Records and Citizen Rights," is especially timely for three reasons: the incoming Carter Administration's interest in national health insurance programs; the increasing use of computers in health care; and the current debate over the individual's right to control the use of his personal health data.

The report looks at the current methods of recordkeeping and the rules governing citizens' rights in health organizations. It describes how computers are being used and their effects on personal recordkeeping. It also identifies policy alternatives that might safeguard citizens' rights as health data systems are created and become more prominent.

"Most computerized health data systems are being created or expanded without sufficient consultation in advance with groups representing citizens' rights and doctor-patient interests and without some kind of proceeding open to the general public," the study stated.

Few health data systems analyzed how much and what kind of identifiable personal data they really need to perform their functions, Westin discovered.

In addition, very few computerized organizations have adopted procedures for patients to have access to their own records.

"What we have today are ambiguous and ill-defined systems that leave people uncertain and fearful about their capacity to control the circulation of their medical and health data," Westin said.

HIS Sets Workshops On Security Problems

PHOENIX — Security and privacy problems associated with DP networks and distributed information systems will be emphasized in a new series of workshops here sponsored by Honeywell Information Systems, Inc. (HIS).

The three-day workshops — scheduled for Jan. 25-27, Feb. 15-17, March 22-24 and May 10-12 — will feature case studies, team analysis, guest speakers and special sessions devoted to actual abuses of computer security or privacy.

Emphasis will be placed on developing methods to prevent security and privacy violations, according to Jerome Lobel, HIS security manager and workshop organizer. Efforts to legislate computer security at the state and federal levels will also be discussed, he said.

Registration for each workshop is \$350, which includes course materials. Further information is available from Lobel at HIS, P.O. Box 6000, Phoenix, Ariz. 85005.

Between the summer of 1974 and April 1976, Westin and his team of researchers compared the impact of computer use in "primary health care," at physicians' offices, hospitals, clinics and health units of institutions like colleges, corporations and the military.

They also focused on the computer's role in the payment of medical services, in quality-of-care reviews and in social applications involving health data, such as employment procedures, life insurance and welfare applications, law enforcement and child-buse programs.

"Traditional laws and organizational policies have not kept pace with the new flows and uses of health information throughout our society," the study revealed.

"Standards to resolve the growing policy

debates are lacking in many sectors of the national health care systems.

"This leaves computer systems developers in health care without clear policies to guide the automation of files and assemblage of data systems," it continued.

Overall, computerization in health care hasn't been as extensive as it has in banking, law enforcement and taxation, although the report noted automation in the field is growing in use and sophistication.

Some believe rising health costs and the prospect of national health insurance will serve as the impetus to a rapid development of computerized systems in this area, according to Westin.

However, his study concluded that expansion of computer use for hospital information systems isn't imminent. This is

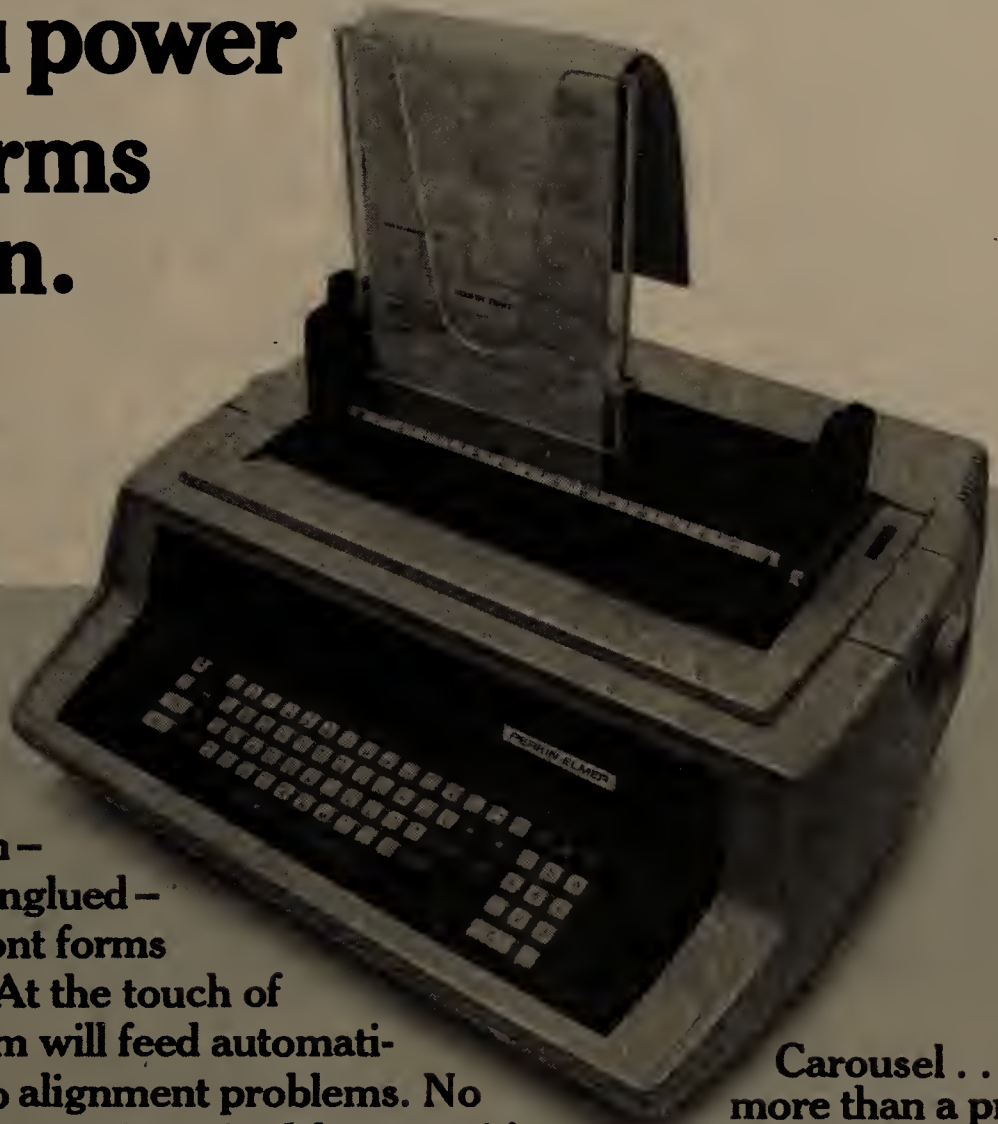
because conceptual models of such systems that are cost-effective and acceptable to the health profession and to the public don't yet exist, Westin explained.

The study profiled six organizations involved in automating personal health records to examine how organizational policies and computerization efforts are affecting citizens' rights.

These inquiries indicated the development of computing and communication at health organizations "is still essentially a matter of organization artistry, not management science."

While some new laws are helping to determine how citizens' rights will be treated in health systems, the study concluded that the real decision making in this area continues to rest with health organization management.

Only Perkin-Elmer Terminals give you power front forms insertion.



Take any multi-part business form — bottom glued or unglued — drop it into our front forms insertion device. At the touch of a button, your form will feed automatically. That's it. No alignment problems. No forms separation or tearing. And because it's power-driven, it increases operator throughput.

Carousel . . .
more than a printer.



PERKIN-ELMER | TERMINALS DATA SYSTEMS | DIVISION

Randolph Park West, Route 10 & Emery Avenue
Randolph, NJ 07801 201 366-5550 TWX 710-987-7913
Overseas, call: 44895-52441 Uxbridge, UK
887-1000 Sydney, Australia
416-677-8990 Mississauga, Ontario, Canada

Yes, I want the terminal that can handle my forms.

Name _____ Title _____

Company _____ Phone _____

Address _____

City _____ State _____ Zip _____

Estimated No. of Units _____

Interested in handling: ☐ ledger cards ☐ front forms insertion
☐ multipart continuous forms ☐ automatic feeding and stacking
documents and certificates ☐ independent journaling and forms
printing ☐ alternate type fonts (Specify) _____

MISSISSIPPI STATE CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received by the CDPA, 508 Robert E. Lee Bldg. Jackson, MS, 39202, up until 2:00 p.m. 1-31-77 for the following data processing equipment:

Request for Proposal No. 276 for the purchase of a Hewlett Packard 2112A computer and related equipment.

Request for Proposal No. 277 for the purchase of a DEC model DC10B asynchronous communication port expanders.

Request for Proposal No. 278 for the purchase of a programmable electronic calculator.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

Clyde P. Ballard, Executive Director
Central Data Processing Authority

DP Plotting Helps Coast Guard In Search for Missing Tanker

By John P. Hebert
Of the CW Staff

BOSTON — While efforts continued earlier this month to predict the course of the Argo Merchant's spilled oil cargo, the U.S. Coast Guard brought its Computer-Assisted Search Planning (Casp) efforts into play to help locate the missing Grand Zenith.

When the Panamanian-registered tanker, with its cargo of eight million gallons of industrial oil, was last heard from on Dec. 29, the ship's officer reported the tanker was dropping speed because of heavy seas off Nova Scotia's southern tip, a Coast Guard spokesman said.

Although life jackets from the ship were picked up by a joint U.S.-Canadian search party, attempts to find the Zenith were called off last week. The tanker is presumed

to have broken up and sunk in heavy seas.

The search for the Zenith was guided by computer and manual plots of the 200- by 170-mile-corridor from Massachusetts' Cape Cod to Nova Scotia, according to George Watts, assistant branch chief of the Coast Guard's Search and Rescue (SAR) Coordination Center here.

A team of five computer programmers and another five analysts and project managers in the New York City-based SAR Amver Center plotted the most likely area of the tanker's location using wind, weather and last-known location data — and a "set of standard Control Data Corp. peripherals" tied to a CDC 3300 mainframe in Washington, D.C., according to Lt. Cmdr. John Hanna, chief of that center's analysis branch.

Unexpected Dump

The search for the missing tanker was hampered in its first week when the Amver Center accidentally "dumped all of the input data" compiled for the mission, Boston SAR's Watts said.

The Boston center was "up to its ears with the Grand Zenith," Watts said, because the New York program dump "happened at the worst possible time." The accidental dumping was an unusual incident, he quickly added.

The effects of wind and ocean currents on ships or planes lost at sea usually can be calculated by the computer system in about one hour, including all input and turnaround time between Boston, New York and Washington, a Boston SAR staff member said.

The program dump delayed the search four or five hours because the Boston staff was forced to manually calculate the weather and current factors, he said.

The Amver Center receives all transit information about merchant ships, including cargo, flag, course and location destination and cargo, Hanna said. From that data, files are maintained on the system and updated on a regular basis to be used for identification, rescue efforts and other needs.

Models Gauge Path Of Argo Oil Spill

(Continued from Page 1)

The Survey has received data on the Gulf Stream and North Atlantic currents to reliably predict the spill's course in the coming months, Smith said last week.

The Coast Guard had computer simulation programs on-line before the Argo Merchant went aground. After the grounding, it provided a printout every 12 hours predicting where the surface oil slick would be, according to Lt. David Frydenlund, head of the Coast Guard's Oceanographic Unit of Computer Operations for Search and Rescue here.

The Coast Guard model not only receives updates on tides, wind and ocean currents, but also uses data from periodic overflights of the entire slick.

Generating the forecast requires one to two hours of turnaround time on the Coast Guard's Control Data Corp. 3300 CPU here.

The Coast Guard utilizes the model because of a "primary responsibility, by law, to protect the navigable waters of the U.S. However, we usually end up trying to protect the beaches," Frydenlund said.

The simulations are also performed to answer the question of how to cope with the spill from the Argo Merchant because of the probability that the Merchant's spill is not the last in a series, he added.

There will be daily updates for several months until the spill threat is ended. "There is no textbook solution to the type of spill the Argo Merchant presents," Frydenlund said.



**If you're
paying
IBM rental
for 3270's...
you're paying
too much.**

Systems Financing will sell or lease IBM 3270's for much less than you are now paying. Any or all of a large inventory is available on flexible lease terms or attractive purchase prices. Why pay more . . . call (214) 368-7703 or write

Systems Financing, Inc. • 6116 N. Central Expressway,
Suite 620 • Dallas, Texas 75206

NCR Mini, Micro Among Systems Shown for First Time

(Continued from Page 1)

NCR's Basic Plus 6 (Extended Basic). Scheduled for delivery during this quarter, soon-to-be-announced peripherals for the system include a 30 char./sec thermal printer, 132 char./sec matrix printer and bisynchronous communications capabilities.

A standard configuration including the control/display unit, keyboard, single cassette recorder, 24K of memory (19K for Basic, 5K user-programmable) and the software license fee cost \$6,995. The unit is not being put out on rental.

NCR also announced the upgrade of its operating systems to Imos III, designed for transaction-driven applications running in multiprogramming environments.

Imos III allows any user-specified terminal to initiate a background job to be run with its regular applications processing when the background task does not require access to the terminal for output.

Stand-Alone Intelligence

Data Terminal Systems unveiled its DTS-510 terminal with full stand-alone intelligence. The 510, which is said to be fully user-programmable, will be released as the 540 later this year for the supermarket industry.

The terminal features an inter-register communications option and transmits POS data over phone lines in standard bisynchronous discipline to the host computer, essentially eliminating the backroom operation, according to the vendor.

General Instrument Corp. showed two additions to its Unitote/Regitel Series 400 POS system, the 425A and 430A. The 425A features an interactive keyboard with prompter display while the 430A intelligent terminal guides the salesperson through each transaction by sequential lighting of keyboard action keys.

The 430A also offers full stand-alone capability; both terminals feature a user-programmable

alphanumeric display option designed to expand the versatility of the interactive system.

General Instrument also introduced a "concept" with the availability of a small CRT peripheral to the terminals for such look-up applications as bridal registry and big-ticket items. The data base is updated automatically after each sale and operates off the excess storage capacity of the backroom minicomputer.

TRW announced the availability of the Model 2805 data collector and forwarding device, designed

to provide the communications link between a small number of POS terminals in a typical specialty store with the chain's

**CW
At NRMA**

central computer, thereby eliminating the need for a controller.

Datatrol introduced the RS-6100 POS system which

features a store-level communications controller that is said to support any combination of up to 90 POS or credit authorization terminals.

In addition, the RS-6100 offers a minicomputer-based central processor.

Prices for the controller range from \$15,950 to \$20,450. The 6100 uses high-level languages and has greater capacity to handle more disk drives in printers and other peripherals than its predecessor, the RS-6000, Datatrol said.

Datatrol also exhibited the

FT-32, a self-supporting terminal system that contains a built-in modem for communicating with a central credit authorization computer. It also contains a microcomputer to control and monitor clerical functions at the point of sale.

Finally, IBM demonstrated 3650 enhancements. The latest features include the 3767 printer keyboard for hard-copy output, an enhancement for the 3657 ticket unit for all-ticket capability and a mass merchandizer keyboard for the 3653 POS terminal.

Get The Fat Out... Of Your COBOL With OPTIMIZER II



You can't see the fat, but it's there! And you're paying for it.

No matter how efficient your COBOL programs are, a certain amount of fat is compiled into them by the COBOL Compiler. That fat adds on about 20% more storage and about 10% more CPU time to each run if you're using IBM's Version 4 or VS COBOL "OPT" option... even more if you are using Version 2, Version 3 or COBOL F. You pay for that fat every time you run in terms of turnaround, response time, and system capacity.

OPTIMIZER II, a program product from Capex, does what your COBOL programmer can't. OPTIMIZER II automatically trims the fat normally compiled into your program, providing you with substantially smaller, faster COBOL object programs. It works with any of the IBM OS or OS/VS COBOL compilers, giving you immediate improvement in program performance.

OPTIMIZER II is already in use at hundreds of OS and OS/VS data centers throughout the world. To put OPTIMIZER II to work for you, call the COBOL experts today.



capex
CORPORATION

2613 N. 3rd Street / Phoenix, AZ 85004
Phone: 602-264-7241 / TWX 910-951-1594

In Europe Contact: CGS Products / London,
Paris, Dusseldorf, Brussels, Rijswijk ZH.

UP YOUR PERFORMANCE

with the

EDP PERFORMANCE REVIEW

A monthly review of techniques and methods, products, literature and services to help EDP management achieve maximum productivity.

- Tutorial Reports
- Products & Services
- Current Literature
- User Experiences

Subscription: \$48.00/year.
Write now for a free sample issue and index.

Applied Computer Research
P. O. Box 9280
Phoenix, AZ 85068
(602-944-1589)

Consumer Acceptance Predicted

EFT Concept Seen Evolving Into Reality in Next Decade

By Toni Wiseman
Of the CW Staff

NEW YORK — Electronic funds transfer (EFT) is not a single concept or phenomenon which can be looked at like automating accounts receivable. Rather, it is an evolutionary process which will take another decade to become total reality, attendees of the National Retail Merchants Association (NRMA) annual convention were told here last week.

While the industry is well aware of the contentions over EFT, one important question remains: Why would a consumer ever choose to instantaneously debit his bank account through EFT when he can get a two-day float by writing a check or a 30-day float by using a credit card? Blair Shick, senior consultant for Arthur D. Little, Inc., asked.

Focusing "on the forest and not the trees" Shick said it appears the industry will be dealing with two evolutionary stages before arriving at the point where the volume of transactions and social changes will effectively herald the arrival of EFT.

CW At NRMA

"The evidence is convincing that, within [the first] five-year period, the networks will indeed be built and subsystems will emerge as an embryonic national system," he stated.

During the 1982-1987 period, the volumes will begin to take off and the industry will

witness the evolution of the multifunction transaction card, he predicted.

Impetus for EFT

Taking a closer look at the coming decade, Shick noted several factors which are providing impetus for EFT.

First, the technology necessary to implement EFT networks is available today, although system refinements are inevitable, he noted.

Check and credit losses as well as efficiencies and cost savings are further reasons for promoting EFT development, as is increasing competition between financial institutions, retail organizations and credit card companies, he said.

Finally, there is the actual cost of the physical locations. Banks want to put as many outlets as possible as close to the con-

sumer as they can, Shick pointed out. The cost differential between the "brick-and-mortar" office and an EFT terminal speaks for itself, he said.

Effects at POS Level

On the other hand, there are several factors affecting the point-of-sale (POS) development of EFT, such as the existence of other EFT systems (automated clearing-houses, automated teller machines) and authorization/verification systems.

Competitive offerings from financial institutions will certainly affect the spread of EFT services offered by retailing entities at the point of sale, he said.

Consumer sophistication or adaptation is also a factor to be reckoned with, he said. And, finally, the resolution of regulatory problems is negatively affecting POS development, he stated.

These key regulatory issues include the question of off-premise installations and, in particular, liberalizing branch banking restriction, Shick said.

Also at issue are interest-bearing demand accounts which, he said, are the basis for the transaction account which will evolve with full EFT systems.

Equalizing lending powers — allowing savings and loan institutions, for instance, to issue credit cards — will also have a definite effect, he said, and there is still the issue of the confidentiality of financial records.

Consumers Accepting Idea

Shick noted progress is apparent in consumer acceptance. Consumers accept the existence of credit authorization terminals, for instance, and preauthorized services such as automatic Social Security check deposits are slowly making inroads.

Each experience impacts another and builds the sum of the total environment, leading the consumer to accept the next level of progression, Shick said. For example, consumers are being indoctrinated with the idea that the government wouldn't use direct deposit unless it worked; it therefore carries the "Good Housekeeping Seal of Approval," which paves the way for direct deposit of paychecks, he said.

There are currently about 4,500 banking terminals installed across the country but, as consumer acceptance increases, so will the number of terminals, Shick stated, estimating 10,000 to 12,000 terminals by 1980.

By 1982, the multipurpose transaction card will appear as a synergy of all past consumer experiences, he predicted, as the consumer becomes aware of its benefits.

Consumers will be faced with a choice between EFT and the paper systems by 1981 or 1982. As he begins to see the changes in cost per transaction with interest-bearing transaction accounts, however, the consumer will move to increased use of the debit cards, Shick forecast.

Bank Teller Assailed By Cardless Client

DORAVILLE, Ga. — A loyal bank employee here withstood physical assault recently, all in the line of duty.

John Hulme, an irate bank customer, attacked and beat the teller when she refused to give him back his bank card. The teller was identified only as "Tillie," the *Rivertown Times* reported.

Tillie "suffered internal damage" after Hulme began hammering away at her with a heavy instrument, according to police reports.

Hulme was charged with felonious criminal damage. Tillie's recuperation from the vicious attack will reportedly cost more than \$1,000.

Tillie, the automated teller machine, has refused to comment on the incident.

On-line updating and inquiry
Alternate logging capability
Protection of scratch and non-scratch status
Audit and inventory reports
Console sharing for multiple CPU's
Automatic scratching of tapes
Simple interface to OS
Scheduling and control of tapes being moved to off-site location
Automatic uncataloging of scratch tapes
Non-quiescing of tape jobs while backing up the master
Unchanged JCL for users
Non-degradation of system performance
PLUS — On-site training and installation — at no extra charge

TLMS Release 4		Other
Yes	✓	Yes
Yes	✓	No
Yes	✓	Yes
Yes	✓	Yes
Yes	✓	No
Yes	✓	Yes
Yes	✓	No
Yes	✓	Yes
Yes	✓	No
Yes	✓	No
Yes	✓	No

What You Want From A Tape Library System — You Get From TLMS Release 4.

For more information, write or call:

Gulf Computer Sciences, Inc.
1775 St. James Place
Suite 160
Houston, Texas 77056
Tele. (713) 627-9320

NOTHING BEATS ...

GOOD USED COMPUTER EQUIPMENT
FOR COST/PERFORMANCE !

MAXI  OR MINI        

Now at the **PRICE** of a Big **MINI!!**

- ★IBM 360/50 I
- ★UNIVAC 1108
- ★IBM 360/40 H
- ★UNIVAC 70/45-II 131K
- ★HONEYWELL 4200
- ★HONEYWELL 635 164K
- ★SINGER 10
- ★UNIVAC 494

All in Stock Now...and Ready to Ship!

IBM

2314 1x9
2 Channel
Switch

CALCOMP 1x4
3420-5 Type
Tape Subsystem

360 /40 H
2 Channels

360/50 I
3 Channels

★ **CASH NOW** ★
FOR YOUR 370/158

2401-4 and 2803-2
SPECIAL PACKAGES

I/O SETS
1443-N1 PRINTERS

F1435 8K BUFFER
for 370/168

265K CORE
for 360/65

ALSO IN STOCK: 2415-1, 2841, 2311, MAI 2301, 2741, 2303-1,
2321-1, 2150-1, 082, 084, 026, 2702, CDC240 Interactive DISPLAY

1403-N1 SPEED

AT 20% OF THE COST

A COMPLETE FACTORY REFURBISHED
DATAPRODUCTS OFFLINE 1333LPM
PRINTER SYSTEM

- INCLUDES TAPE DRIVE
 - MAINTENANCE AVAILABLE
- \$9500**



UNIVAC

1108 CPU or SHARED CPUs

65K CORE MEMORY
for 1106, 1108, 1110

- FEATURES
- MEMORY
- CTMs and CTMC
- DRUMs
- PRINTERS
- CARD I/O
- TAPE DRIVES
- 1004-11 DLT-1

9400, 9300, 9200
LTC-1, CARD or TAPE

1710-4
"NEW"
CARD PUNCH

SPECTRA
70/45-11
SYSTEM 131K

SINGER SYSTEM 10
COMPLETE DISK SYSTEM

BURROUGHS B700 32K
COMPLETE SYSTEM

AMERICAN USED COMPUTER

CALL US TODAY! **617-261-1100**

P.O. BOX 68 KENMORE STATION
BOSTON, MA 02215

WE BUY, SELL, TRADE
AND APPRAISE ALL
COMPUTER EQUIPMENT

FIRST CLASS
Permit No. 41186
Boston, Ma.

BUSINESS REPLY MAIL

No postage necessary if mailed in U.S.A.

POSTAGE WILL BE PAID BY

**AMERICAN USED COMPUTER
CORPORATION**

P.O. BOX 68, KENMORE STATION
BOSTON, MA 02215

NOTHING BEATS...

GOOD USED COMPUTER EQUIPMENT
FOR COST/PERFORMANCE!

◀◀◀◀◀◀◀ MAXI OR MINI ▶ IN STOCK NOW



CENTRONICS...101...\$1250

101A	165 CPS, 132 Col.	301	165 CPS	80 Col.
101AL	LSI VERSION	306	100 CPS	80 Col.
101S	GRAPHICS VERSION	308	120 CPS	80 Col.
102A	330 CPS, 132 Col.	500	100 CPS	132 Col.
102AL	LSI VERSION	501	165 CPS	132 Col.
		508	165 CPS	132 Col.

DEC...PDP...8, 9, 10, 11, 12, 15

8i...8K.....\$2500	8L...8K.....\$1950
MC8i 4K.....\$1500	TU 55.....\$750
MM8e 4K.....\$1200	TU 56.....\$2500
DF32/DS32.....\$2150	DF32D/DS32D.....\$2950
MM11L...4K.....\$350	11/45...CALL US TODAY
11/20...4K.....\$3050	PDP12 LINC 8K
PDP15 8K	



THOUSANDS
OF DEC UNITS
IN STOCK

ALSO MORE PRINTERS, PAPER TAPE, CARD I/O, DISK TERMINALS,
MODULES, CPU OPTIONS, MEMORY, COMMUNICATIONS, and OTHER PERIPHERALS



ALL an ASR 33 IS
and MORE!

OLIVETTI 318...\$950

- BUILT-IN PAPER TAPE I/O
- BUFFERED KEYBOARD
- SPROCKET OR PIN FEED
- EXTRA 10 KEY NUMERIC PAD
- 64 CHANNEL ASCII
- OLIVETTI SUPPORT

ALSO: ASR 33...\$845, KSR 35...\$600
MEMOREX 1240-7 KEYBOARD PRINTER

DATA GENERAL 2/10...32K

\$7500

ALSO: 800 JUMBO,
1200 NOVA, UTIMACC II, DCC 116

OTHER MINIS IN STOCK

HONEYWELL 316, 416, 516
RAYTHEON 704, GA SPC
LOCKHEED MAC16, VARIAN 6201
SEL 810A, 840MP, GRI 909, CAI LSI-11
UNIVAC EMR 6050 GTE TEMPO I

★ SPECIAL KITS and UNITS ★

FOR EXPERIMENTERS and HOBBYISTS

★ A KIT FOR EVERY CHIP! ★

ONE DAY SHIPMENT!

INTERSIL

INTERCEPT Jr.
6100 MPU KIT...\$281
PDP-8 EMULATOR

NATIONAL SEMI

SC/MP MPU KIT...\$99
20 KEY
TERMINAL KIT...\$95



LEAR SIEGLER ADM-3

KIT...\$875 ASSM & TEST...\$1175
UPPER/LOWER CASE OPTION...\$100
10 KEY NUMERIC PAD...\$150

IMSAI 8080A

KIT.....\$599
ASSM and TEST...\$931
4K MEMORY.....\$139



SOUTHWEST TECH

6800 MPU KIT...\$395
4K MEMORY.....\$125

A COMPLETE LINE IN STOCK!

KIM-1	6502 COMPUTER.....\$245
KIM-2	4K MEMORY.....\$179
KIM-3	8K MEMORY.....\$289
POWER SUPPLY KIT for MPU+4K.....\$25	

ICOM FRUGAL FLOPPIES FROM \$1195

GREEN PHOSPHOR VIDEO MONITOR...\$150



- STANDARD 1V P to P INPUT
- 12 MHz BANDWIDTH
- RASTER SCAN
- 12" CRT, SOLID STATE, ICs
- ANTIGLARE 1/4 INCH ETCHED FACE PLATE

PRINTERS

TALLY T132...\$950
GOOD ALTERNATIVE TO CENTRONICS 101A
100 LPM, 64 Char., 132 Col., ASCII PARALLEL
ODEC 1321 110 LPM, 64 Char, SERIAL...\$950



DATAPoint

3300-200...\$475

Thermal printer uses
NCR EMT1AE parallel printer
with Datapoint serial interface



MDS 4330 Buffered Chain Printer
Floor Unit: 64 Character, 300 LPM,
136 Col. with 12 Channel VFU

PRINTERS ALSO FROM DATAPRODUCTS
CDC, DIABLO, and MANY OTHERS

CARD READERS/PUNCHES

DOCUMENTATION READERS TO 1200 CPM
M300L, M600LR, M1000LR, M1200L
TRUE DATA 600...600 CPM.....\$950
ALSO BRIDGE, CDC, GDI, PDI, DATAPRODUCTS
DATAPRODUCTS SP 120 OEM PUNCH.....\$2500

DISK DRIVES

DIABLO 31.....\$1950
DIABLO 33F.....\$1500
CAELUS 303-2...\$3000



OTHERS ALSO
IN STOCK!

TAPE DRIVES

BRIGHT 2610-21
800 BPI.....\$950
1600 BPI.....\$1250
SYKES CC100 CASSETTE...\$950



NOTICE: THIS FLYER REPRESENTS
HIGHLIGHTS OF A WIDE RANGE OF DISK,
TAPE, CPU, MPU, PAPER TAPE and CARD
I/O, PLOTTERS and OTHER UNITS IN STOCK

AMERICAN USED COMPUTER

CALL US TODAY! **617-261-1100**

P.O. BOX 68 KENMORE STATION
BOSTON, MA 02115

COMPUTER WORLD

☐ I WANT TO BUY: _____

☐ I AM INTERESTED IN: _____

☐ MORE DETAILS ON: _____

☐ CALL ME AT: _____

☐ I WANT TO SELL: _____

ADD ME TO MAILING LIST FOR:

☐ BIG CPUS

☐ MINIS

NAME: _____ TITLE: _____

FIRM: _____

STREET: _____

CITY: _____ STATE: _____ ZIP: _____

Sign up now for the Computer User event of the year!

Case Studies in Data Processing

the special Computer User Forums held in 9 cities—in conjunction with

COMPUTER

EXPO



Register now to participate in a city near you — and also attend *free* the largest multi-city computer show of the year!

Each of the Computer User Forums will be conducted by a leading user or independent consultant who will lead seminars and workshops on these relevant, up-to-date topics.

Tuesday: Case Studies in Applying Minicomputers — the Mini as Mainframe; Distributed Minis with Communications; Organizational Impact of a Distributed Mini System.

Wednesday: Case Studies in Managing Terminal Networks — “Dumb” Terminal Networks; “Intelligent” Terminal Networks; Remote Batch Systems; Communications Aspects of a Network’s Use of Minis.

Thursday: Case Studies in Improving Software Productivity — Personnel Recruiting, Selection and Training; Software Alternatives; Measuring Systems Utilization; Documentation and Maintenance Aids.

All Forums will take place from 9 AM to 1 PM.

Concurrently, hundreds of exhibitor products and services will be shown at Computer EXPO 77 each day from 10 AM to 5 PM. There is no admission charge to the exhibit hall.

See the latest and the best in:

Data Communications Terminals, Minicomputers, Software, Printers, Data Input Equipment, CRT Terminals, Computer Output Equipment, Data Communications Interconnect Equipment, Supplies, Magnetic Media, Modems, DP Education, Small Business Computer Systems, Mini-peripherals, Flexible Disk Drives, Magnetic Tape Transports, Cassette Systems, Microcomputers, Keyboards . . . and more!

HOW TO REGISTER FOR THE FORUMS

(No advance registration or admission charge is required of qualified executives for the Computer EXPO program — including exhibit hall and exhibitor seminars. Your business card will admit you.)

Send to:
Registration Office
Computer EXPO 77
797 Washington Street
Newton, MA 02160
(617) 965-5800

Register me for ☐ all three days
☐ Tuesday
☐ Wednesday
☐ Thursday

Name _____ Title _____
Company _____
Street and Number _____ City _____
State _____ Zip _____ Telephone () _____

Check city in which you plan to attend:
(your acknowledgement form will include complete details on times and locations)

- | | |
|---|--|
| ☐ San Francisco | March 29–31, San Francisco Civic Auditorium |
| ☐ Los Angeles | April 5–7, Los Angeles Convention Center |
| ☐ Cleveland | April 19–21, Cleveland Convention Center |
| ☐ Minneapolis/St. Paul | April 26–28, St. Paul Civic Center |
| ☐ Chicago | May 3–5, McCormick Place |
| ☐ New York | May 10–12, New York Coliseum |
| ☐ Philadelphia | May 24–26, Philadelphia Convention Center |
| ☐ Washington, DC | May 31–June 2, Sheraton Park Hotel |
| ☐ Boston | June 7–9, Northeast Trade Center (Rte. 128, exit 39) |

(Registration for any single forum day entitles you to attend all three days of exhibits. If you wish to attend the exhibits only, no advance registration is required.)

☐ Check Enclosed ☐ Purchase Order Enclosed ☐ Charge my American Express

Cardholder Number

Expiration Date _____

Cardholder Signature _____

PAYMENT RECEIVED

☐ \$45.00 One Forum Day ☐ \$80.00 Two Forum Days ☐ \$115.00 Three Forum Days

Please Circle 1 Number in Each Category

BUSINESS/INDUSTRY

- 10 Manufacturer of Computer or DP
Hardware/Peripherals
20 Manufacturer (other)
30 DP Service Bureau/Software/Planning/
Consulting
40 Public Utility/Communication Systems/
Transportation
50 Wholesale/Retail/Trade
60 Finance/Insurance/Real Estate
70 Mining/Construction/Petroleum/Refining
75 Business Service (except DP)
80 Education/Medicine/Law
85 Government — Federal/State/Local
90 Printing/Publishing/Other Communication
Service
95 Other _____

TITLE/OCCUPATION/FUNCTION

- 11 President/Owner/Partner/General Manager
12 VP/Assistant VP
13 Treasurer/Controller/Finance Officer
21 Director/Manager of Operation/Planning/
Administrative Service
22 Director/Manager/Supervisor DP
23 Systems Manager/Systems Analyst
31 Manager/Supervisor Programming
32 Programmer/Methods Analyst
41 Application Engineer
42 Other Engineering
51 Mfg. Sales Representative
52 Other Sales/Marketing
60 Consultant
70 Lawyer/Accountant
80 Librarian/Educator/Student
90 Other _____

COMPUTER CARAVAN 77

A division of Computerworld, Inc.
797 Washington Street, Newton, MA 02160

Do it now.

A NEW
GENERATION
OF ...

SOLUTIONS
FOR ...

MINI
BUSINESS
USERS ...

BLIS / COBOL
SOFTWARE

- Powerful File Management System
- Simultaneous Multiple Program Execution
- Dynamic Virtual Memory Management
- Index I/O
- Multiuser Sort
- On-Line Data Entry
- On-Line Debugging
- Multiuser Interactive Programs

ANS '74 BLIS / COBOL DOS / VS

For more information in a hurry call...



305 / 293-9431

6237 EDGEWATER DR. • ORLANDO, FLORIDA 32810



THE DESIGN, MANAGEMENT AND FUTURE OF DISTRIBUTED PROCESSING, DATA BASE, TELEPROCESSING, and NETWORK SYSTEMS

7-11 March	SAN FRANCISCO	Hotel Mark Hopkins
14-18 March	HOUSTON	Houston Oaks Hotel
25-29 April	AMSTERDAM	Hotel Okura
9-13 May	TORONTO	Hyatt Regency Hotel

These seminars are part of the 1977 James Martin World Tour Programme which will also include:

TOKYO	MELBOURNE	SINGAPORE	DELHI	TEHRAN
LONDON	RIO DE JANEIRO	BOSTON	CHICAGO	LOS ANGELES

For full details telephone:-

203 227 6778 - In the U.S.A.

0253-403016 - in Europe

403 429 5921 - In Canada

or complete the following coupon or write AIRMAIL to:-
ABAQUEST, 221 St. Anne's Road, Blackpool, FY4 2BL, U.K.

Please send me full details of the James Martin Seminar in

Name Organisation

Address

Calendar

Feb. 1-4, New York — **Distributed Data Processing**, sponsored by the American Institute of Industrial Engineers (AIIE). Contact: Dept. 3PR, AIIE Seminars, P.O. Box 3727, Santa Monica, Calif. 90403.

Feb. 6-9, Los Angeles — **1977 Western Workshops and Exhibits of the International Security Conference**. Contact: Executive Director, International Security Conference, 2639 S. La Cienega Blvd., Los Angeles, Calif. 90034.

Feb. 7-9, N. Hollywood, Calif. — **1977 Winter Convention on Aerospace and Electronic Systems (Wincon '77)**. Contact: C.A. Christofferson, Wincon '77, 5500 Canoga Ave., Woodland Hills, Calif. 91364.

Feb. 7-11, Chicago — **World Fair for Technology Exchange**. Contact: E. Bailey Prine, Dr. Dvorkovitz & Associates, P.O. Box 1748, Ormond Beach, Fla. 32074.

Feb. 7-9, Washington, D.C. — **Life Cycle Management for ADP Systems**, sponsored by the American Institute of Industrial Engineers (AIIE). Contact: Diane Summers, Dept. PR, AIIE Seminars, P.O. Box 3727, Santa Monica, Calif. 90403.

Feb. 8-9, Washington, D.C. — **Federal DP Expo '77**. Contact: Robert E. Harar, Marketing Ventures, Inc., 5012 Herzel Place, Beltsville, Md. 20705.

Feb. 9-10, Peoria, Ill. — **Geometric Modeling and Automated Process Planning**, sponsored by Computer-Aided Manufacturing-International (CAM-I). Contact: C.H. Link, Executive Secretary and General Manager, Suite 1107, CAM-I, 611 Ryan Plaza Drive, Arlington, Texas 76012.

Feb. 10, Baltimore, Md. — **Data Processing Day**, sponsored by the Data Processing Management Association. Contact: J.

William Yox, Publicity Chairman, c/o Arundel Center, MS-1, Annapolis, Md. 21404.

Feb. 13-16, Atlanta — **1977 Bank Telecommunications Workshop**, sponsored by the Operations and Automation Division of the American Bankers Association (ABA). Contact: Constance Williams, Operations & Automation Division, ABA, 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

Feb. 14-16, San Francisco — **Minicomputer Applications Conference**, sponsored by the American Institute of Industrial Engineers (AIIE). Contact: Diane Summers, Dept. PR, AIIE Seminars, P.O. Box 3727, Santa Monica, Calif. 90403.

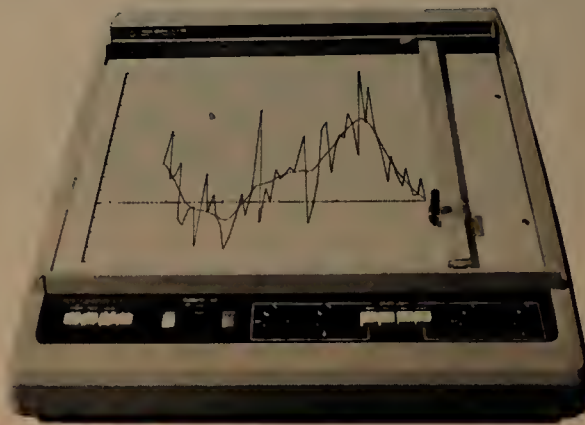
Feb. 14-18, New York — **Fundamentals of Finance & Accounting for Non-Financial Executives**, sponsored by the American Management Associations. Contact: Patrick Daly, Program Director, AMA, American Management Associations Building, 135 W. 50th St., New York, N.Y. 10020.

Feb. 16-18, Philadelphia — **IEEE Solid-State Circuits Council (ISSCC '77)**. Contact: Lewis Winner, 152 W. 42nd St., New York, N.Y. 10036.

Feb. 21-24, Orlando, Fla. — **Operational Data Security Workshop**, sponsored by the University of Kentucky. Contact: Operational Data Security Corp., 6 Swarthmore Lane, Dix Hills, N.Y. 11746.

Feb. 24-25, Sturbridge, Mass. — **New England Computer Users Group**. Contact: Stephen L. Priest, Brockton Hospital, 680 Center St., Brockton, Mass. 02402.

Let us show you the drawing power of HP's computer plotters.



Our Graphic Plotters always draw a crowd when they start to work. Everyone around is quick to notice how the plotter reduces stacks of computer data into meaningful charts and graphs.

The plotters work wonders for electronic and mechanical designers. And sales managers, financial people, researchers, chemists or anyone else who uses data from a computer, time-share terminal or computer-operated measurement system.

With a minimum of software, they let you have graphics for engineering, research, marketing and financial problems. On any size paper up to 11 x 17 inches (28 x 43 cm). In red, blue, green or black.

And prices start at just \$3750 (domestic USA price).

For more information on why HP's Graphic Plotters are a top drawing item, write: Hewlett-Packard, 16399 West Bernardo Drive, San Diego, CA 92127. If you wish, you can have a live demonstration just for the asking. Then draw your own conclusions.

11607

HP Graphic Plotters. Built for times when a fine line separates success from failure.

HEWLETT PACKARD

Sales and service from 172 offices in 65 countries.
1501 Page Mill Road, Palo Alto, California 94304

MIT Program to Allow Students To 'Attend' DP Class Remotely

By Ann Dooley
Of the CW Staff

CAMBRIDGE, Mass. — An MIT-sponsored program will bring the classroom to computer and electronics employees and enable them to earn graduate-level credits during their working hours.

Scheduled to be given in the spring term, which begins in February, the Tutored Video Instruction (TVI) program will videotape each regular MIT graduate class session. Classes usually meet three times a week.

The videotape will be reproduced at MIT and distributed, usually the next day, to companies which have signed up for that particular class.

Initially the TVI program will offer only one computer course, "Semantic Theory for Computer Systems."

Because the program concept is still being tested this semester, the course offering is limited. Much interest in computers has been shown, so there will probably be a wider range of courses offered later, according to John Newcomb, assistant director of the MIT Center for Advanced Engineering Study.

The employees taking the course will meet at their plants or offices with the same frequency as the graduate students on campus, view the same lecture, have access to the same printed material, complete the same homework assignments and compete with on-campus students for grades, Newcomb explained.

Tutor to Help

The industry workers will watch the tapes with a tutor, usually a company employee who knows something about the subject and who is trained to lead discussions and clarify the subject matter.

The tutor will visit the campus for preparation before presentation of the course.

The advantage of being able to stop tapes to discuss or answer questions is that it adapts the pace of the presentation to the needs of the learner; it improves the performance of those students who are in a continuing education program, especially if they are rusty or slow to learn, according to Dr. Myron Tribus, director of the center.

Israeli Official Asks Data Bank on Citizens

NEW YORK — Israel's computers can't talk to each other yet and, for reasons of economy and efficiency, Amiram Sivan, director of that country's National Insurance Institute, would like to change that.

According to the *American Zionist*, published here, the Israeli government has 40 large computers, each operated independently.

Each department writes down the name, address, date of birth, identity card number and other statistics about people who apply for services, converts it to machine-readable form on cards or magnetic tape and enters the data into its systems.

Since many people deal with several government agencies, the same information about the same people must be processed 10 to 20 times, all at the expense of the Israeli taxpayer.

Possible Solution

Sivan believes a national data base accessible to all the computers of the Israeli government would solve that problem.

Each computer system could draw information as needed and add information that becomes necessary.

As for the fears expressed by some that such a system might violate individual privacy rights, Sivan said the data base could be limited to only the information about each citizen which is already included in their voter registration, which is open to public inspection.

TVI has been found most effective when three to five students watch the video tapes, so MIT has limited the number of people in a group to seven. If more than that number enroll at any one company, additional groups will be formed.

Students in industry can enroll in the program as listeners, special students or degree students.

Listeners watch the tapes but do no homework and do not receive a grade. Special students are those studying to earn credits but not working for an MIT degree. Degree students are those who have been accepted by a department for study toward an advanced degree.

Since MIT requires a thesis for an advanced degree, a limiting factor is the number of thesis candidates who can be properly supervised at any one time.

TAB 2690 HANOVER STREET
PRODUCTS CO. PALO ALTO
CALIFORNIA 94304

Just one of the many leading companies you'll see at

**COMPUTER
EXPO 77**

TAB's complete line of microprocessor based punch-verifiers and key-to-diskette systems provides a flexible and compatible approach to the preparation, entry, conversion, communication, and overall handling of data standard interfaces provide tele-processing and multi-media configurations. TAB systems provide improved operator convenience and productivity.

Organized by:

**COMPUTER
CARAVAN
77**

The national computer exposition that's coming to you.
797 Washington Street, Newton, MA 02160
(617) 965-5800.

San Francisco • Los Angeles • Cleveland • Minneapolis/St. Paul
Chicago • New York • Philadelphia • Washington, D.C. • Boston. Starts March 29th.

Attention: Business Computer Distributors

Don't sell your customers just another computer...

when you can select from
the most comprehensive family
of business computer systems
ever offered...

+ The SYNERGIST™



Start with the broadest choice of business systems ever offered. From a small business mini, to large shared-resource computer networks. Using 3 of the most reliable, best price/performance computer mainframes. The Digital Computer "16" series. Already proven in over 9000 installations.

Add the broadest line of disk systems, CRT terminals, workstations and printers. Designed and tested to operate together in nearly limitless combinations.

Add operating systems. Application libraries. Software support.

Training programs and maintenance support. Developed through years of business computer experience.

Put it together with one company responsible for system engineering, compatible operation and reliability.

End up with systems with a difference. Systems that can be scaled up without expensive reprogramming. That can start small without future penalty. With big system features. Like plain English requests for special reports. Text retrieval systems. Confidential file security. Spoolers. Editors. Performance at every size level at a price more businesses can afford.

We're still adding the most important part. The smartest, best managed distributors in the business. It's the final link that makes our systems work. If you're the link we missed, write, or call Ronald S. Harvey, Business Systems Sales Manager, 201-575-9100.

Ask about our "Master Distributor," "Private Label" and "Dealership" programs.

We're Digital Computer Controls, Inc. The company that other computer companies call *their* computer company.



DIGITAL COMPUTER CONTROLS INC

The Quiet Mini-Maker. We're Number 2.*

12 Industrial Road, Fairfield, N.J. 07006, (201) 575-9100

TWX 7107344310

*In the number of minicomputers currently being shipped to Original Equipment Manufacturers

The inventors of magnetic tape make a more reliable "Winchester" and it's guaranteed forever.



Back in 1932, BASF invented magnetic tape . . . the forerunner of such modern data processing media as the 3348 "Winchester" Data Module. And, because our error testing is twice as critical as drive manufacturer's specifications, we warranty our Data Module to be free from manufacturing defects for as long as you use it.

BASF research has made significant improvements on the Winchester. While still completely compatible with existing 3340 drives, our new Data Modules feature an exclusive oriented oxide coating and polishing technique which offers 30-35% better resolution properties than competitive Winchester-type packs.

Our new finish allows the read/write heads to fly uniformly and four times smoother than independent competitive module heads . . . resulting in greatly reduced possibilities of error generation. In

addition, BASF has developed a special disk-surface lubricant, which eliminates disk coating wear and consequent contamination and errors. This lubricant also eliminates, for the first time, any possibility of a head sticking to the disk surface while the module is stored.

BASF Data Modules are available in three configurations: the 1335 Module, with 35 million-byte capacity; the 1370, with 70 million-byte capacity; and the 1375, with fixed head and quicker access.

For complete details on the BASF "Winchester" Data Module, write: BASF Systems, Crosby Drive, Bedford, MA 01730, or call our nearest regional office: in Los Angeles, (213) 451-8781; in Dallas, (214) 233-6607; in Chicago, (312) 343-6618; in Clifton, N.J., (201) 546-9111; in Montreal, (514) 341-5411; and in Toronto, (416) 677-1280.

BASF The Original.

Computer Tapes Disk Packs Flexydisk Word Processing Supplies

DP Helps Recruit, Place Physicians In Rural Areas

By Ann Dooley
Of the CW Staff

SALT LAKE CITY, Utah — A program designed to match doctors with medical practices in rural mountain areas has begun to emphasize the personal approach because of the lack of success in earlier computer matches, according to officials.

Since 1974, the Physician Placement Program here has used a Univac 1108 to recruit, match and place physicians in areas which normally lack medical care.

The computer match was only moderately successful because of its limitations in weighing the importance of personal factors and its inability to correlate the ambiguous answers given by both the physicians and the regions, according to Dr. Richard Kirk, project director.

Now, the computer is used just in the first step of the winnowing-out process, Kirk said.

Communities receive the names of the first six doctors on the list and the doctors receive a similar list of communities. Then personal interviews and tours are arranged so that each party can find out about the other.

Modifying Questionnaire

The questionnaire also is being changed to include more social and cultural aspects important to both groups.

The program is set up so that interested physicians fill out the 100-question computer form as do communities requiring medical personnel.

The questionnaires include a number of criteria including social, cultural and medical background information.

The communities answer questions about their physical aspects, including geography, demographics and economy; what kind of medical care is currently available; and their cultural and social characteristics, such as the dominant religion, the mix of people and their acceptance of outsiders.

The data is then tabulated to match as closely as possible the needs of both parties.

Since the program began in 1972, the ratio of applicants has remained fairly static with 200 rural communities requiring doctors and 100 physicians looking for that kind of environment, according to Kirk.

Problem Causes

There were several reasons for the system's lack of success in matching applicants, Kirk said. One reason is that it simply lacked the human element.

Another problem was that only a limited kind of information was put down on the forms. Communities might not want to admit they encourage one kind of person or religious preference over another, when in actual practice they do, Kirk said.

"We will continue using the computer match as part of the process because of the high volume of information to be processed," he added.

The program, which has placed about 40 doctors, is funded by the Department of Health, Education and Welfare through the University of Utah.

We're looking for

PROGRAMMER/ANALYSTS

INTERMEDIATE & SENIOR LEVELS (No Banking Experience Necessary)

Starting salaries \$18-26K

IF YOU CAN ANSWER THESE 5 QUESTIONS OFF THE TOP OF YOUR HEAD, YOU'RE THE PERSON WE WANT TO SPEAK TO.

- What is the order of merge of DCB parameters when a DCB is opened?
- What is the most efficient USAGE to define for a COBOL subscript?
- How many length codes are there in each of the following assembler instructions: MVC, ZAP, CVD, ED?
- Which IBM utility would you use a) to rename a data set? b) to compress a partitioned data set? c) to list the contents of a direct access volume? d) to print an ISAM file?
- If your program ABENDED at a low main storage address, how would you approach solving the dump?

These questions are part of our 2-hour technical interview. You'll be interviewed by two of our Programmer/Analysts or Systems Analysts. After a brief screen for applicability by a technical representative, these two people are your first contact with our bank. You have to get through these two people first if you want to work here. They'll ask you questions . . . technical questions. They're not true and false questions; nor fill-in-the-missing-word questions; nor "circle-one-of-the-above" questions. They're in-depth questions calculated to thoroughly evaluate your technical knowledge. So that the Technical Interview Team can probe deeply and expertly inventory your skills . . . to compare against all open job requisitions in the Systems and Planning Department...to determine which position would best suit your skills.

Most people (approximately 75%) fail our technical interview. Our standards are really high. Did you answer all five questions correctly? Do you think you're good enough to pass a two-hour in-depth technical interview? Did you know Manufacturers is looking for more good Programmer/Analysts and Systems Analysts?

ABOUT MHT: One of the country's largest commercial banks, we are also a sophisticated user of EDP. State-of-the-art, MHT is an OK place for EDP professionals. There is job security in a stable environment; a computerized skills matrix, career ladder and mobility system designed by computer professionals for computer professionals; in-depth semi-annual performance reviews and professional counseling; a special EDP Human Resource technical staff; an abundance of technical courses for EDP professionals . . . all paid for by the company, and on the company's time. Systems and Planning is a totally integrated department, and not an appendage to any user department. Your hours can be flexible, any time between 8:30-10:00 am for seven consecutive hours. Working conditions are superior. There's a terminal close by for testing, you're surrounded by EDP professionals; education's one floor above you. It's a good professional environment, and you won't have to leave to get ahead.

You can improve your marketability right here. Right now we've got:

IBM OS/MVT utilizing IMS CICS TCAM TSO. (VS and MVS coming), plus we have installed with more on order **large-scale NCR's** to develop new retail datacenters **and many smaller stand-alone computers.**

For a convenient interview with a technical representative, call (212) 623-3276; OR write to Systems and Planning Department (someone who wasn't looking for a job doesn't have an up-to-date resume, we know that; it's OK to write); OR drop by some time. Our Technical Interview Teams will be on duty from 8am-8pm Monday through Friday this week to see you if your experience is applicable.

★ **If you're a Systems Analyst (at intermediate or senior level), don't be shy . . . we have room for you too.**

MANUFACTURERS HANOVER

Systems and Planning, CW 0117, 39th Floor 55 Water Street, South Building, New York, N.Y. 10004.

We are an Equal Opportunity Employer, M/F.

Copyright 1976



Editorial

The Carter Cabinet

President-elect Jimmy Carter has chosen three members of the IBM board of directors and one member of the board of directors of Western Electric (an AT&T subsidiary) for Cabinet posts at a time when both of those firms are being sued by the government on charges of monopolization.

In addition, he has chosen a man whose law firm works for IBM to be Attorney General.

In many ways, this attests to the high caliber of people who are attracted to the boards of these two corporations. Individually, they are talented and energetic and would appear to be the type of people who would make excellent Cabinet appointees. They surely will be confirmed by the Senate, which started hearings on their qualifications last week.

But on another level the choices are disturbing.

All of the board members involved work for companies that the U.S. Department of Justice alleges are guilty of monopolistic practices. If the department proves those charges, that will mean each of these four serves on the boards of directors of companies engaged in breaking the law of the land.

Directors are supposed to oversee the activities of the corporations they serve. However, it is not clear that any of these board members has actively questioned whether the company he serves is a monopolist, guilty of illegal activities.

So, if the charges are true, we may end up with four Cabinet members who once served on the boards of corporations actively engaged in breaking the law. While antitrust is not viewed by many as being as serious as robbery or assault, it is still against the law and a serious offense.

As Griffin Bell undergoes hearings before the U.S. Senate on his confirmation as Attorney General, it is to be hoped that any ties to IBM will be fully explored.

If Bell becomes the leading government "trustbuster," his partnership in the Atlanta law firm of King and Spalding must be totally severed.

There are some critics who pointed out that minor credit and collections cases handled by Bell's law cronies for IBM are a far cry from serious conflict of interest regarding the Justice Department's antitrust suit.

But if Bell were to throttle the Justice Department's vigorous pursuit of the antitrust case, it would obviously work to the benefit of the corporation.

More importantly, it would make a mockery of the long, intensive months spent by the non-political antitrust staff in Justice to prosecute this case.

This is not the time to condemn Bell unfairly. It is an important issue and it should be objectively disposed of by the Senate. The process of advise and consent should include a fair examination of all pertinent issues on an equal basis.

The people will, of course, give up all connection with the firms when they take office. But will they want to actively pursue their former benefactors and will they create a climate where vigorous actions against those benefactors can take place?

It seems unlikely.



'Now That We're Past the Elections, How About a Little Reprogramming?'

Letters to the Editor

Coverage of Carter's Cabinet Informative But Questionable

The lead article in the Dec. 27-Jan. 3 issue ["Carter's Attorney General Choice Tied to IBM"], while informative as to the backgrounds of some of the President-elect's administrative team, was rather oblique as to any other meaning.

It has been a long-standing practice of Presidents to select people of stature in the business community to serve in the Cabinet or other high-ranking positions.

Since no conclusion was drawn in the article as to the merits of having such individuals serve with the government, I am at a loss to understand the reason

you chose to "headline" the matter.

Having been a user of other vendors' computer equipment for some years and, therefore, having no particular bent toward IBM, I found this article a rather tepid, boring part of what appears to be a *Computerworld* policy of rather unfounded inferences that IBM is somehow controlling the computer industry, the government and any other arena into which it delves.

Perhaps the visibility of IBM-associated people in government and business circles is a reflection of their individual talents rather than the conspiratorial atmosphere you seem to present.

James L. Healy

New York, N.Y.

Brown's Order Lacks Controls

I cannot find fault with Gov. Jerry Brown's rationale that privacy is "fundamental" by virtue of the California Constitution ["Brown Again Nixes Calif. Privacy Law," CW, Dec. 13]. By initiative ballot in 1972, the citizens overwhelmingly voted to affirm such a fundamental right.

What is disturbing about Brown's substitution of an executive order, which is supposed to protect the citizen's privacy and guarantee the right to petition for redress of grievance, is that the executive order apparently does not establish any functioning mechanics to prevent or expose misuse or mishandling of information.

Bureaucrats and politicians alike are not apt to pay much heed to such an executive order, not necessarily with malice, but through simple ignorance or preoccupation with primary functions. Such is the "nature of the beast" which is at the heart of the problem and is the more frightening aspect.

Brown is not being his proclaimed pragmatic self if he believes that by this stroke of his pen he is accomplishing privacy guarantees that work.

As a matter of fact, as I interpret this, one's right to privacy is not exercised until it is shown to have been violated.

Perhaps, as a practical matter, privacy as an issue is not pressing. But the sad and bad thing about the privacy matter is that as each day goes by, the erosion of our anonymity accelerates.

Thomas E. O'Connor

Ben Lomond, Calif.

Searching for a Basic Version

We are looking for a version of Basic or Basic-like language (Mumps, etc.) with data base or at least random file access capabilities running on a Digital Equipment Corp. PDP-8E under OS8.

Floppy data base is preferred. Any help will be appreciated.

Grant Schampel
Department of Pediatrics

Box 184-Mayo Station
University of Minnesota
Minneapolis, Minn. 55455

Data Past

Five Years Ago
Jan. 19, 1972

WHITE PLAINS, N.Y. — IBM announced that DOS support for its 360 line was to end and future enhancements of DOS would be directed toward the 370. It said DOS Release 27, scheduled for the end of May 1972, would be the first DOS release to operate exclusively on the newer line of CPUs.

WASHINGTON, D.C. — AT&T rejected the Federal Communications Commission's (FCC) request to modify its interconnection tariff requirements. The Independent Data Communications Manufacturers Association told the FCC that Bell's interconnection policies were discriminatory.

AT&T refused to comply on grounds that the FCC would place "undue emphasis on the need to promote competition for the benefit of a few suppliers."

Eight Years Ago
Jan. 22, 1969

NEW YORK — Cobol-to-PL/I conversion appeared to be a near-reality for OS/360 users — at least according to an IBM document dated Dec. 16, 1968, which was received by several people.

The people who received the document then received a follow-up letter apologizing for the "inconvenience it may have caused" and requested its return.

An error occurred when a "functionary" of IBM attached the wrong mailing list to the job slip for circulation, according to an IBM spokesman.

WASHINGTON, D.C. — AT&T announced it would release details of the specific tariff revisions it was prepared to make, according to Bernard Strassburg, chief of the Federal Communications Commission's (FCC) Common Carrier Bureau.

The tariffs were filed by AT&T following the FCC's June decision that the existing "foreign attachments" tariffs were unlawful.

Growth Opportunities Limited

Top of Operations Ladder Frustrating to Key Personnel

By Jack Stone

Special to Computerworld

One of the recent trends found in the larger DP installations is the movement toward planning and implementation of career development programs for DP technical personnel. The concentration of activity has been on the systems analysts and programmers, who have historically received the primary attention of management in the allocation of personnel development resources.

Operations personnel, generally characterized as "non-professional" in the industry — in spite of their abilities to get the work out the door under usually difficult circumstances — have universally received the short end of the development stick.

To illustrate the situation that exists in operations, I interviewed Mary Jo Blair, a shift supervisor with a large-scale 370/168 installation in Washington, D.C. If the reader wants to learn the secret of how to drive away experienced, productive and loyal computer room supervisors, just use the formula prescribed by Mary Jo's installation.

Q. Mary Jo, how long have you been involved in DP?

A. Well, I started in 1958 as an EAM operator and worked in the peripheral equipment processing area until 1967, when our installation obtained its first computer. I then operated the 360 equipment, staying with the upgrades as they occurred, and worked with the 30, 40, 50 and 65. I was promoted to assistant shift supervisor in 1971 and soon after was working with the

370/145.

I was promoted to shift supervisor in 1973 and have stayed in this position as our installation upgraded to our current 370/168.

Q. And what is the general structure of your installation?

A. We have a 4M-byte mainframe supported by OS/VS2 with TSO, RJE and Hasp. Our installation serves as an internal "service bureau" within the U.S. Department of Agriculture.

Q. What are your regular duties at your installation?

A. We have an average of about 12 people per shift who handle all the operations functions: scheduling, console, tape/disk handling, library (about 29,000 tapes and 180 mountable disk packs), JCL assistance, etc. We handle all customer support in the operations area, which is quite challenging since the bulk of our workload is on-line.

Q. Do you have special responsibilities delegated to you?

A. I think we are very fortunate in having assignments for management tasks that I don't believe are common to other installations. We are viewed as more or less at the branch chief level and participate in staff meetings, financial planning, personnel administration and similar activities.

Q. Do the operations personnel have specific assignments?

A. They do, but they are all cross-trained so practically all of them can perform reasonably well at any job.

Q. The cross-training must have involved a rather substantial effort.

A. Well, yes, it has over the years, but the payoff is there. We have had some turnover

as of late, and the training has eased the transition. I should say that our management is very strong on operator training and, as a matter of fact, based on my four years as the Guide project manager on operator training, I am currently on a temporary assignment to plan and implement upgrade training programs for all of our people.

The Human Connection

Q. With the responsibilities, training opportunities and 168 technology, your job appears to be a real winner.

A. Well, not really, no. I'm afraid that all of us operations supervisors have come to the end of our careers. There are no higher level grades available to us as computer operators. There are no future salary increases available either, except to compensate in part for cost-of-living increases (in-grade increases).

Frankly, there is no significant challenge left in the job of computer supervisor because there is nothing to strive for in the job — no new job goal to work toward.

I continue to work hard to maintain good performance ratings, but this is not enough. I feel that I am completely competent in my job and, as most people feel, I want to move higher in the organization in my chosen career of machine operations.

It would be a lot better if there were another level above, even one where the

qualifications may be very difficult to attain. At least I could find another challenge to work harder — much harder — and try to achieve a difficult goal.

Q. If, in fact, you are at the top of the operations ladder, have you considered changing your career by transferring to another area?

A. This is practically impossible in my organization, because only trainees are accepted in almost all situations.

Q. Are there possibilities for training for other careers that are made available to operations personnel?

A. Not really. Essentially all of our training is oriented to the current operations job.

Q. I hate to bring it up but, in spite of nearly 20 years of service with your organization, have you thought about leaving?

A. Most definitely, yes. Quite frankly, I feel that I have too great an interest and capability to be satisfied with what I consider to be a repressive environment. I have done some initial explorations, but I just haven't had the time to pursue the matter aggressively.

Q. It sure appears that growth opportunities for the computer operations supervisor in your installation are very limited. Fortunately, your high-level grade and ongoing salary should compensate in some measure for the lack of growth.

A. Well, you'd think so. Unfortunately, a general downgrade in job classification was recently announced for all operations personnel. As an incumbent, my grade and salary are protected but nobody can tell me for how long.

Management's Lack of Time the Cause of MIS Failures

Top-level management does *not*, in fact, operate the way it says or even the way it thinks it does. That is the surprising result not of one, but of many independent studies that have been performed recently.

In fact, top-level management has hardly any time to really consider new projects or deeply concentrate on specific subjects. The average top-flight executive has been observed to have less than one 35-minute-long session a week to get down to such concentrated thinking.

The researchers suggest this lack of time — which was previously unappreciated — is the reason why many management information system (MIS) failures have occurred. They have a point. If the executive hasn't time to use an MIS as more than a big set of file drawers, then the real use is not going to occur.

And, if the system is not really used, then it is a failure, even though it does everything the glossy specifications say it will do.

However, it appears to me there is a much greater problem facing DP as a result of the research findings than this comment on MIS failure, and that problem extends to most DP areas and is not just restricted to MIS operations.

Basically, what is being said is that management is not really reviewing things in their true complexity — even when they have been presented with the full complexity. Clearly, the pattern of actual MIS use practically precludes any deep complex appreciation.

Management must then be working selectively — choosing between alternatives whose complexities have, hopefully, already been appreciated by someone else.

Such selectivity is all very well when there are people around who do appreciate the complexities and are prepared to provide

such predigestion before letting top management get hold of a job. And it may also work where there are ways to test out the claims involved before having to make a commitment to some course of action, or where management is intrinsically up-to-date and fully informed about the subject matter.

But where these items are not present, then undigested complex material had better beware. Mistakes may occur early and not in the implementation area, but instead in the understanding.

DP is a complex matter and requires just the type of detailed consideration that management cannot give to anything — even though it thinks it can. And, of course, only management itself can really review management information systems, for they are the future users of them.

If, as now appears, management doesn't have the time available it thinks it has and has really delegated downward the task of ensuring that complex subjects have been properly thought through before being broached, there is a much easier explanation for the reported failures of MIS than the one the researchers reported.

Under such unappreciated circumstances, the causes of failure would not only come from management's lack of time to use the MIS — it would also come from the fact that management does not have time to properly review the presented specifications.

So the error may be really the result of undigested specs, no matter how well they were implemented. And that is the real danger, DP-wise.

It is almost inevitable that pioneering DP projects are complex and are presented to top management for consideration with many complexities still left to management evaluation. It is also true that DP, by its nature, cannot be tried before considerable commitment has been made. Yet, further, few are able to keep up-to-date in the DP field and become top executives.

So — for DP in general and not just MIS operations — this means the major shield

that protected the basic approval of complex DP projects has been found to be just a falsehood. Management may be needed to approve DP projects, but the record is that it really does not have the chance to do so!

What can a DPer do about the situation? Well, as I see it, he must simply recognize the situation and realize he is on his own.

He might try breaking management's job into two parts, first asking it to recognize the implications (which now will have to be worked out, and prioritized from a negative point of view) right in the DP department before presenting any complex system for review. Or he might break up a project into smaller bits rather than attempting to do too much at once. The possibilities are almost endless.

But something must be tried, because it is

now clear our old stand-by "user requests" as the reason for DP failures simply isn't proper when it comes to information management.

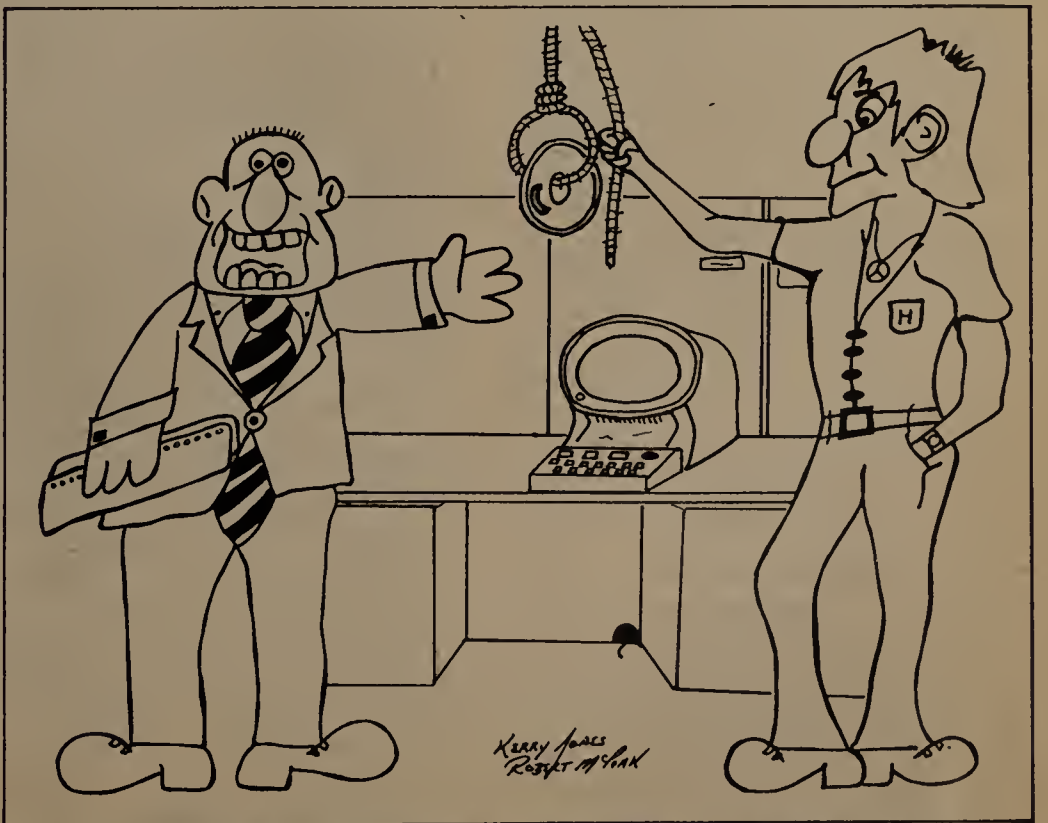
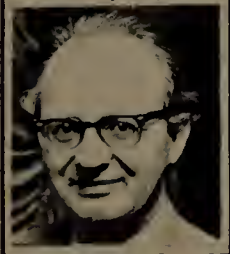
We know now — something many of us have believed for a long time — that most "user requests" and "user approvals" are simply too easily given to cover a decent study of consideration.

And without a proper study from somewhere, not biased toward the project, the whole thing can be a technical tour de force — and still a box-office failure.

© Copyright 1977 Alan Taylor. Reproduction for commercial purposes requires written permission. Limited numbers of copies for non-commercial purposes may be made provided they carry this copyright notice. The views expressed in this column do not necessarily reflect those of Computerworld.

The Taylor Report

By Alan Taylor, CDP



'You'd Think He'd Know by Now What I Meant by "Hanging a Tape"!

Locks Don't Deter Professionals

Cryptography Urged as Practical Means of Security

By James R. Kitchen

Special to Computerworld

Today, with the proliferation and abundance of highly sophisticated electronic equipment coupled with the guidance of the rating-happy media (which teaches today's youth how to commit various crimes from petty larceny to grand theft with only a few hours of selective viewing), a knowledgeable person can penetrate and compromise any facility from almost any location, either remote or local.

The hegemonic middle and upper managements believe a barred door will keep the bogeyman away. These restraints may be tantamount to security checks or physical barriers.

But, as any law enforcement officer will tell you, a locked door may keep out the amateur, but it won't keep out the professional thief.

Professionals Not Deterred

The amateurs or radicals may be deterred by a well-developed bulwark such as solid doors, card locks and security personnel with guard dog. However, professional thieves will consider them routine and proceed with the appropriate counteraction.

These professionals are capable of bypassing alarm systems, finding and tapping the facility's data links, bribing or coercing employees and of writing programs which can bypass any software restraints. It would be no problem for a group with this level of expertise to breach a facility and remove,

copy or exchange data files.

There are two possible ways to discourage the professional thief. The first is to move all valuable data to a secure location such as a bank vault or a crypt. Although this would be perfection from a security officer's point of view, management of a system with this constraint could prove to be both costly and time-consuming.

Cryptographic Approach

The second approach is to use cryptography. A simple, inexpensive routine that can, by transfiguration, modulate the data to the extent that it is nonrecognizable may be implemented by any facility.

The data, once converted, could then be written onto the files or transmitted over the data link where it could be reconverted to its original form.

The routine can be a simple bit reversal or a complex multilevel algorithm depending on the internal requirements of the facility. The program should be modular in form and coded as an integral nonlabeled step within the system. This would prevent the routine's label from being written to the

The Human Connection

system library and utilized by unauthorized personnel.

The module must be capable of converting the data to nonnormalized characters and back to its original form. This would greatly reduce any attempt to obtain data

outside the standard job streams with its in-line checks and system constraints.

Alleviates Fear

With a cryptographic routine in place, management fears of theft or fraud can be alleviated and credence can be given to statements dealing with security. Once this brick is placed on the security wall, the only other items the facility manager should worry about are natural disasters (fire, flood and earthquake), deliberate interference (acts of war, sabotage and work stoppage) and others (loss of programs and damage to equipment).

These problems can and must be anticipated so the destructive potential is minimized.

Kitchen, a consultant for the past 12 years, is presently with the State of South Carolina.

Letters to The Editor

Most Cases of DP Fraud Originate in User Shops

For several years now our external auditor, in his annual letter to management, has recommended that we discontinue the practice of permitting programmers to conduct unsupervised testing on the computer because it would "permit the unintentional or intentional alteration of programs or files without the possibility of detection."

Every week we make four check runs in support of four different applications. In each case, the run is edited and balanced to predetermined user totals and a check register is printed.

It is my sincere opinion that the danger of undetected fraud is far greater in the user organizations where records are created and source documents are produced for balancing than it is in DP where any tampering would surely result in out-of-balance conditions.

It is my further opinion that most cases of "fraudulent use of the computer" originate in the user shops and not in the computer room. And yet, I never see any recommendations from the auditors to tighten the controls over creation of source documents.

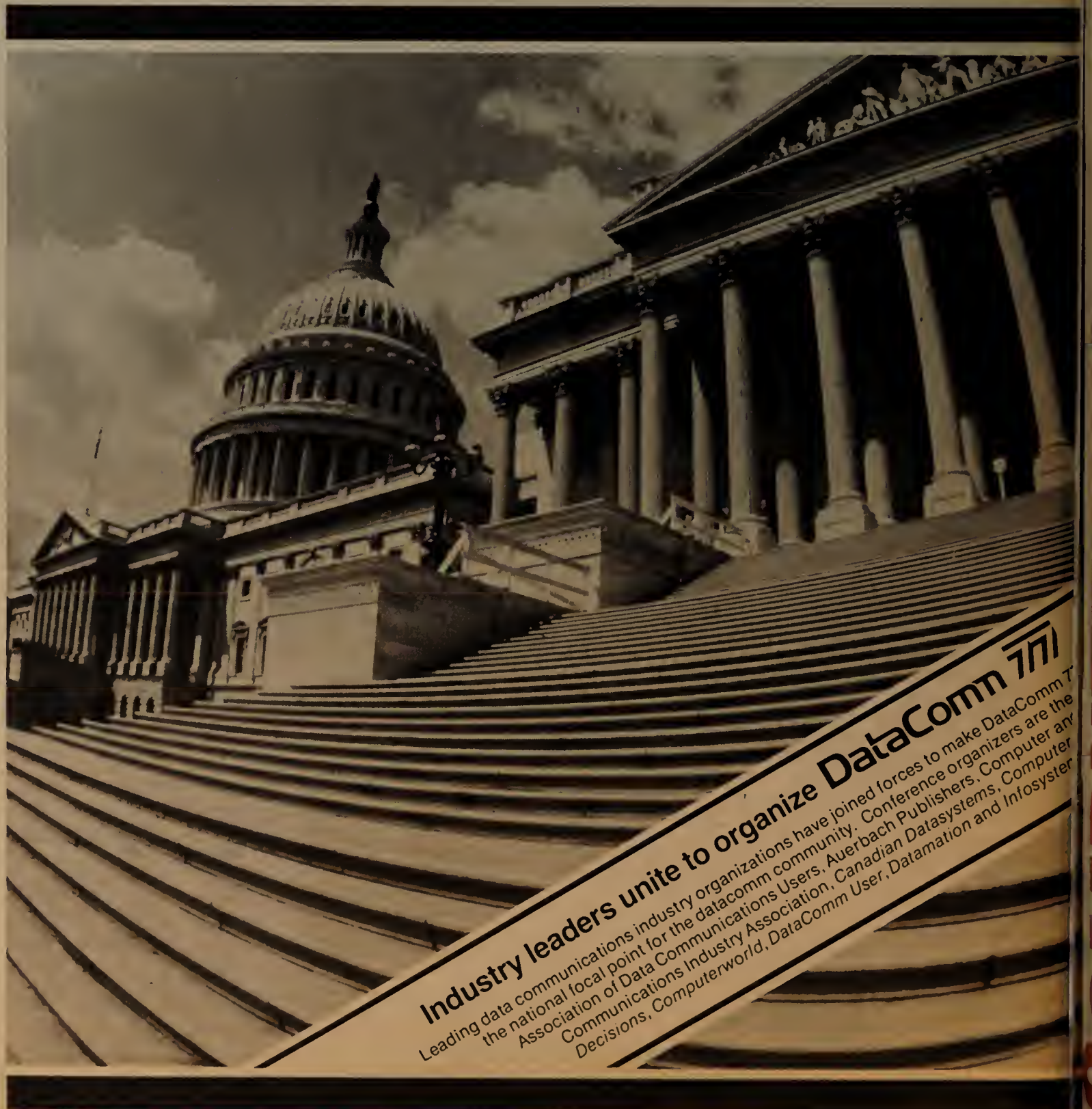
William T. Ziegler

Annapolis, Md.

Kybe Magnetic Tape Certifier Model CS - 1600

Factory maintained. Excellent condition. 7/9 track. Spare parts and microscope. 10K firm. Scott Crozier (206) 593-7036.

Be where the in data com



Industry leaders unite to organize DataComm '77

Leading data communications industry organizations have joined forces to make DataComm '77 the national focal point for the datacomm community. Conference organizers are the Association of Data Communications Users, Auerbach Publishers, Computer and Communications Industry Association, Canadian Datasystems, Computer and Decisions, Computerworld, DataComm User, Datamation and Infosystem.



...the one
weekly newspaper
that's designed to fulfill your
unique "need to know"...
the one newspaper that can
give you all the current
information you need to benefit
you, your organization and
your career progress...
52 weeks of incisive news,
commentary and special
reports...subscribe today,
use the attached postage paid
order form.

☐ **Please enter my subscription**
(details on back)

☐ **I'm already a subscriber,
but I'd like you to
change my:**

- ☐ **address**
- ☐ **title**
- ☐ **industry**
- ☐ **other**

My current mailing label is attached
and I've filled in new information
on the other side.

Put old label or label information here

Expiration Date: _____

COMPUTERWORLD

Detach here, fold, and place in post-paid envelope attached through binding.

FAA Air Traffic Control System: Rush to Automation?

By Kenniston W. Lord Jr.

Special to Computerworld

It was my privilege recently to cross the country along with a "dead-heading" pilot from a major U.S. airline. During the trip we discussed the problems which have been experienced by pilots and air traffic control personnel vis-a-vis computer system outages.

Of course, computer system outages are largely transparent to the aircrews on duty above Flight Level 18, or 18,000 feet. It may not be immediately apparent from the instruments but, according to my companion, it's indicative of the kinds of problems the whole air network is experiencing.

It appears that in their rush to computerize the skies, the Federal Aviation Administration's (FAA) wizards overlooked a number of critical aspects of air control. To paraphrase the words of my companion, they removed the judgment from the pilot-in-command in the cockpit

and invested it in the hands of the ground assembly, ranging from the semiskilled computer programmer to the uleer-prone air traffic controller.

In the shift, the lives of several million people have been placed in jeopardy.

To begin with, much data which could effectively be telemetered to automated traffic control radar stations is required by the FAA to be relayed via radio and is therefore subject to crowded airspace and misunderstanding.

Having finally received such data, the controller is required to go through a lengthy process of keyboard data entry. This data entry process requires considerable manual skills and dexterity.

The result of all this keyboard entry is that the controller is forced to remove his eyes from the screen, or radarscope, in order to execute function or free-form commands to the computer system.

This can then mean that two "blips,"

representing aircraft, might not be noticed on a collision course until too late, especially when shifted from radar sector to radar sector.

... And in This Corner

The shift to another radar sector is a manual operation in the midst of an otherwise highly automated ground operation. It is done simply via the telephone.

The pilot with whom I traveled told of repeated attempts to establish radio contact with ground controllers, only to discover that he was unable to answer because of the lengthy process of manual sector change. Thus, the ultimate Achilles' heel of the entire air traffic control process could theoretically get well out of hand in the

required process of manually dialing the telephone.

And when two aircraft are headed on a collision course, each at 500 miles per hour, the entire flying public is at peril.

Another Problem

Computer-generated enhancement of aircraft identification data presents yet another problem. The characters displayed on the screen are large enough and sufficiently luminated to negate or obliterate the radar-echoed "skin" image, that image returned by the metal of the aircraft itself.

Thus, under close proximity, surveillance is virtually impossible.

To further complicate matters, on-board proximity-warning computer systems are not yet required by the FAA, though they are currently available. Like any other business, the airline industry will not invest in that form of equipment until absolutely forced to do so.

The problem continues inside the cockpit. Under Instrument Flight Rules (IFR), the pilot is required to monitor and report to the controllers items which are available for readout on the instrument panel.

To observe the instrument panels on any of the available jet aircraft, both the pilot and his first officer are required to remove their eyes from the window of the cockpit to fix them on the instruments. In a final approach under 1,000 feet and moving at a speed of at least 200 miles per hour, this is not only tricky but highly dangerous.

So what we have is the total investiture of command decision in automated ground control in a computerized system which FAA acknowledges is radically less than perfect. Assuming that the system has been constructed carefully and tested thoroughly — which it has not — one is left to wonder just whatever happened to safety in the rush to automate.

There is no doubt that automation of the air traffic control system is a practical necessity, but one wonders why more care has not been exercised and why controllers must be saddled with extensive and patently dangerous keyboard entry and other manual "shift-off" procedures.

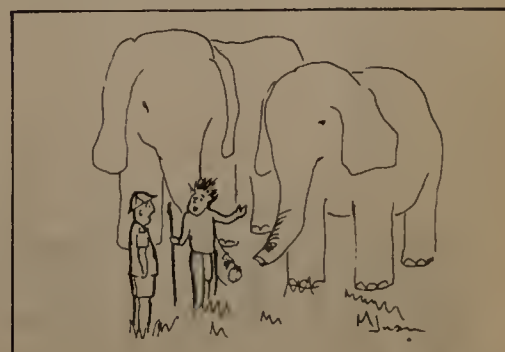
Further, on-board instrumentation exits which can present critical data to be displayed on the aircraft windows, permitting the command pilot to keep his eyes outside the cockpit while reading the instruments.

What price tag can be given to the value of a human life, or, for that matter, a planetload of human lives?

Here, then, is the paradox. In the rush to place control on the ground, the FAA has presented a system which is by far faster and more efficient, as is necessary, but at the same time more cumbersome and patently dangerous.

In the cockpit, where the final life-or-death decisions rest, the necessary automation has been slighted.

Therefore, as I ride from coast to coast, I'm reminded of the story of the old math professor during the aircraft bomb scares. While I will continue to fly, I'll have to continue to place my trust in the pilot and the aircraft, both of which have been licensed and certified against mandatory and legally enforceable standards, and none at all in the computer system which controls and tracks our progress, a computer system which has received the benefits of neither licensing nor certification and for which there are no standards whatsoever.



'... And This Model Has a 32K Memory.'

Action is Communications

DataComm 77 ANNUAL CONFERENCE AND EXPOSITION, WASHINGTON, D.C., MARCH 9-11, 1977

Organized by:

**Auerbach Publishers • Association of Data Communications Users • Computer and Communications Industry Association
Canadian Datasystems • Computer Decisions
Computerworld • DataComm User
Datamation • Infosystems**

Join us for the data communications conference you don't want to miss... your annual national conference organized by the industry leaders.

That's DATACOMM 77. It promises to be the biggest, best, and most information-packed conference we've put together yet.

Program planners have taken full advantage of the Washington, D.C. conference site to arrange an outstanding series of special sessions dealing with governmental data communications. You'll hear about datacomm procurement within the federal government. You'll learn how data communications works for the military and for federal, state, and local governmental agencies and about systems for information exchange between agencies. You'll also have opportunity to express your views at our unique evening "Town Meeting" with FCC officials. In addition, you'll be brought up-to-date on legislation and other activities taking place right now in the nation's capital.

All this in addition to helpful and informative sessions on planning, implementing, and managing data communications... plus workshops and discussions on the latest developments in datacomm applications with special emphasis on distributed data processing and networking.

You'll also see what's new in datacomm products and services. Leading vendors have signed up for participation in the DATACOMM 77 Exposition. It's a great opportunity for you to gather first-hand information. To compare product features and capabilities. To get the data you need to make critical purchase decisions.

Bring your spouse! Our unique Spouse's Program features guided tours, other activities arranged exclusively for our DATACOMM family. Included are major Washington attractions and exciting peeks behind the scenes not offered on public tours.

Dr. William A. Saxton, Publisher of *DataComm User* and Conference Chairman, together with *DataComm User* Editor Morris Edwards, Program Chairman, invite you to join your colleagues for the annual national conference and exposition organized by data-



Dr. William A. Saxton



Morris Edwards

comm industry leaders for all datacomm interests. Be where the action is... DATACOMM 77, Sheraton Park Hotel, Washington, D.C., March 9-11. Send the coupon now for details.

I'm interested...

Dr. William A. Saxton,
Conference Chairman, DATACOMM 77
60 Austin Street, Newtonville, Ma. 02160

☐ I may attend DATACOMM 77
☐ My company may want to exhibit.
Please send me more details.

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Telephone _____



Questions? Want to register? Use our toll-free Hot Line: 1-800-225-3232. (In Mass. call 617-964-4550 collect.)

erisa?

If the personal penalties for management violation of the Employee Retirement Income Security Act of 1974 have you worried, then take heart.

Wang has software, designed, installed and running, safeguarding the pensions of more than one million workers and the careers of their managers.

For more on ERISA, call Joe Nestor (617) 851-4111, Wang Laboratories, Tewksbury, MA. 01876. In California, call Carl Tarascio (714) 631-0138.

WANG

Surprising Results Often Come From Writing of User's Guides

By Diana Patterson
Special to Computerworld

One technical writer told me he has never written a user's guide that didn't make a change in the organization that used it. I've written quite a few user's guides and I've found this is usually true.

What, might you ask, could possibly be changed by the writing of a user's guide? Easy. Almost anything.

Organizations have a way of working according to rather amorphous rules unless things are so highly structured that corporate standards are enforced to tell you when to visit the washroom. DP departments are frequently exempt from strict codes simply because they have always seemed to be doing something mysterious, that requires late-night machine time and the hiring of strange beings called systems programmers who will quit on you if you ask them to wear ties.

Good systems people are hard to find, so they are given a good deal of freedom.

A user's guide usually becomes a func-

tional specification for a DP department. It allocates responsibility because it has to say where a user gets his problem solved and who will give him a pad of coding forms.

Programmers, rather than managers, are the source for this kind of information. The guide must say how it really works, not how

Reader Commentary

managers believe it works or wish it worked. The idea is to see the world from the user's view.

Once the way things really work is written down and passed around for approval, inefficiencies, inconsistencies and downright communication gaps are glaringly obvious. One recent example I can cite is the case of the unappreciated keypunch department.

When putting together a user's guide for a very large company, the powers that be told each manager to contribute a section relating to his department. The systems people didn't contribute anything. The user services group handed in a string hodgepodge, some good stuff, some junk and a lot missing. The keypunch group contributed a 30-page essay on the design of coding forms.

The coding form design material was totally out of proportion to its need; only two or three people a year might have occasion to look at such an essay.

But the keypunch manager had been so harassed by the misuse of coding forms and the mistreatment of his staff that he had painstakingly constructed rules for avoiding these problems. If the user's guide hadn't been commissioned, his problems probably would have been ignored.

I vetoed the inclusion of his essay on design in the user's guide because bulky user's guides are neither read nor carried to terminals/keypunches. I did suggest that it be made into a small document available on request from someone and that the user's guide state it was available and from whom.

It took a lot of debate among the managers to decide who would be responsible. In the end, the keypunch manager was chosen since he could then update it as his personnel and equipment made that necessary. This meant the keypunch department could control its own work in a way it hadn't been able to do before.

There have been some truly shocking examples of organizational flaws uncovered by user documents. The most notable in my experience was the discovery of basic design flaws in a Fortran compiler I was documenting for a large computer company.

Ignoring all market research, the compiler designers had left out many features and still made their optimized compiler 10 times less efficient than their major competitor. Since the competitor had the slowest optimizer then known, this flaw was significant.

When the documents brought this to light there was only minor consternation.

Organizing information for a user's guide means structure must be imposed. If a department manager doesn't like that structure, it may mean the department — not the table of contents — needs some rearranging.



'Let Me Begin by Saying the Computer Was Old and Probably Due to Be Replaced Anyway.'

Sales and Service ...they go together!

At DATA ACCESS SYSTEMS, INC. we believe that sales and service go together.

Not only do we provide **immediate, off-shelf delivery**, but we offer a 24-hour response to your request for service (most time, same day). Most important, if your terminal cannot be repaired at your site, we will leave a spare.

Our first question to you is - What are your requirements? Our Research and Development department reviews all new terminals as they are put on the market and selects those that are most suitable and reliable to our customers' needs.

DATA ACCESS SYSTEMS, INC. offers for sale and/or lease a full line of data communications terminals featuring:

Diablo HyTerm	- DASI -450
Texas Instrument	- DASI -745 (portable)
Texas Instrument	- DASI -743 (KSR)
Texas Instrument	- DASI -733 (ASR & KSR)
DecWriter	- DASI -360
Lear-Seigler-ADM 1-2-3	- DASI -101, DASI -102, DASI -103
MI ² Corporation	- DASI -760 (Acoustic Couplers)
Techtran	- DASI -841 (Cassette Units)
Flexible Disk	- DASI -800

For a limited time only, DATA ACCESS SYSTEMS, INC. will offer the following reconditioned terminals with a full 90-day warranty:

Univac DCT-500	- \$950.00
Texas Instrument 725	- \$900.00
Teletype 33ASR	- \$675.00

NEW YEAR SPECIAL

FREE - 701 Omnitec Coupler with the purchase of a Texas Instrument 743KSR.

DATA ACCESS SYSTEMS, INC.

is a public company with headquarters at
100 Route 46, Mountain Lakes, New Jersey 07046 (201) 335-3322.

Branch offices:

220 New Boston Park
Woburn, Massachusetts 01801
(617) 933-8822

2727 Wilson Boulevard
Arlington, Virginia 22201
(703) 525-2924

D A S

You can (and probably have) paid more for a terminal with all these design and performance features. But there's no need to pay a premium any longer. The CP10 has broken the price barrier.

And price isn't all. It offers switch selectable transmission rates from 75 to 19,200 bps, and it features full cursor control, RS232C or current loop interface, addressable cursor, erase mode and a hard copy capability with printer interface. The 12-inch digital-type monitor is formatted to display 12, or optional 24, lines with 80 characters per line (upper and lower case optional). And much more.

We know that price and product performance aren't the only criteria for making a buying decision. You'd also like to be sure your supplier will stand behind every purchase.

That's why we give you our full attention, from pre-sale application advice to dependable service and maintenance back-up... nationwide. We've built our reputation on it.

**Another CPC
breakthrough in price,
performance ratio:**

**the price
machine**

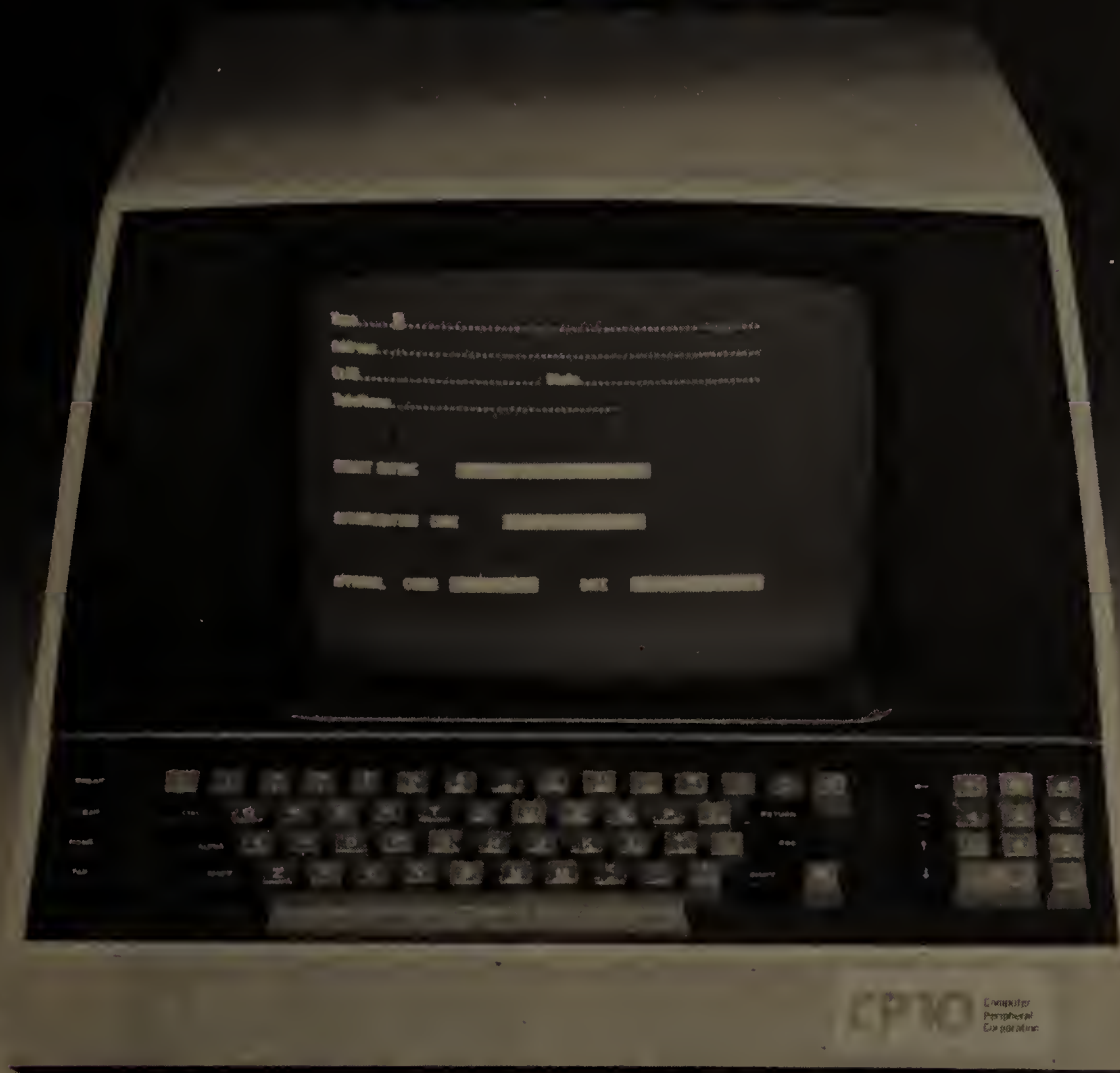
\$955*

CP10 features

- ☐ Cursor Control Keys
- ☐ Erase Mode
- ☐ Addressable Cursor
- ☐ Switch Selectable Transmission Rates: 75 to 19,200 bps
- ☐ Communication Mode: HDX/FDX
- ☐ Auxiliary Interface
Printer Interface or
Storage Media 1/0
- ☐ RS232C and Current Loop Interface
- ☐ Non-Glare Screen
- ☐ Format Mode
- ☐ Numeric Key Pad
- ☐ Many Options

New from CPC!

Low price kits for hobbyists and personal use. Ask for complete information.



For a fast response from anywhere...call us TOLL FREE 1-800-243-9280

Computer Peripheral Corp.
1225 Connecticut Avenue, Bridgeport, CT 06607

Gentlemen: ☐ Please send complete data on the CP line of terminal products. ☐ Please have a representative call. ☐ Please send information on CPC kits.

Name _____ Title _____
Company _____ Phone _____
Address _____
City _____ State _____ Zip _____

(*100 quantity price)

Dealer and distributor inquiries invited.

**Computer
Peripheral** CORP.

1225 CONNECTICUT AVENUE • BRIDGEPORT, CT 06607 / (203) 333-8339

Discover

the one organized (and inexpensive) way to keep up with what's new in computer techniques and management—

The Library of Computer and Information Sciences

and start with a whale of a value:

Take any 3 books for only \$1 each

(values to \$55.40)

if you will join now for a trial period and take three more books—at member discount prices—within the next 12 months

(Publishers' prices shown)

41640. DATA COMMUNICATIONS DICTIONARY. Charles J. Sippl. Complete, up to date, cross-reference guide of over 14,500 data processing and communications terms, including microprocessors, multi-mini-computer systems, laser communications and more. **\$19.95**

62745. MINICOMPUTER SYSTEMS—ORGANIZATION AND PROGRAMMING (PDP-11). Richard H. Eckhouse, Jr. Spells out general computer organization and assembly language programming, and offers a complete guide to all important minicomputer concepts, operations, and applications. **\$15.95**

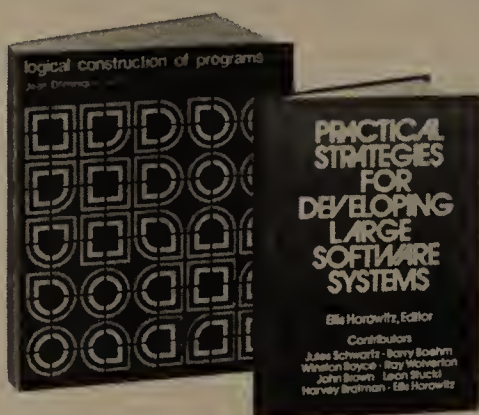
76920. SCIENTIFIC ANALYSIS ON THE POCKET CALCULATOR. Jon M. Smith. Shows how any inexpensive pocket calculator can easily be used to handle complex computations. Covers everything from how to evaluate the roots of polynomials to how to evaluate hypergeometric functions. **\$12.95**

81860. SYSTEMS: Analysis, Administration, and Architecture. John W. Sutherland. Contains the most comprehensive inventory of system concepts ever assembled. Covers everything from system control and design, to system structure, to Bayesian analysis. **\$13.95**

42035. THE DESIGN OF REAL TIME APPLICATIONS. Maurice Blackman. Totally practical guide shows how to design and implement data processing projects using real time modes of processing. Counts as 2 of your 3 books. **\$22.00**

41665. DATA PROCESSING PROJECT MANAGEMENT. Thomas R. Gildersleeve. A step-by-step guide to the development of a data processing system. Stressing broadly applicable concepts, it presents a systematic approach to project management. **\$14.95**

82180. SYSTEMS PROGRAMMING: Concepts of Operating and Data Base Systems. David K. Hsiao. A broad introduction covering assembly systems, input output operations, batch processing operating systems, data base managers, more. Well done. **\$16.95**



69970. PRACTICAL STRATEGIES FOR DEVELOPING LARGE SOFTWARE SYSTEMS. Edited by Ellis Horowitz. Important papers on four basic phases of software development: requirements, design, coding, and testing. Includes a section on management. **\$11.95**

59920. MANAGEMENT: TASKS, RESPONSIBILITIES, PRACTICES. Peter F. Drucker. Peter Drucker's masterwork. 800 pages of superb analysis bolstered by a wealth of case studies. **\$17.50**

42045. DESIGN OF MAN-COMPUTER DIALOGUES. James Martin. Penetrating study of how effective interaction can be achieved between man and machine. Surveys the elements of the equipment used in interactive systems, the basic processes involved, and system application. Counts as 2 of your 3 books. **\$22.50**

58085. LEARNING TO PROGRAM IN STRUCTURED COBOL. Edward Yourdon. Covers all the crucial educational techniques: the concept of COBOL as a "foreign language," the concept of the spiral curriculum, and the concept of the "theory/practice sandwich." **\$17.95**

58810. THE LOGICAL CONSTRUCTION OF PROGRAMS. Jean Dominique Warnier. Approaches program structure as an exercise in solving specific problems logically, and provides a wide array of specific techniques and information for doing so. For both programmers and analysts. **\$14.95**

52215. HANDBOOK OF DATA PROCESSING ADMINISTRATION, OPERATIONS, AND PROCEDURES. S. R. Mixon. Offers a future- and user-oriented system for designing, documenting, and controlling computer center projects. Plus a wealth of practical information on techniques, project management methods, documentation standards, more. Counts as 2 of your 3 books. **\$24.95**

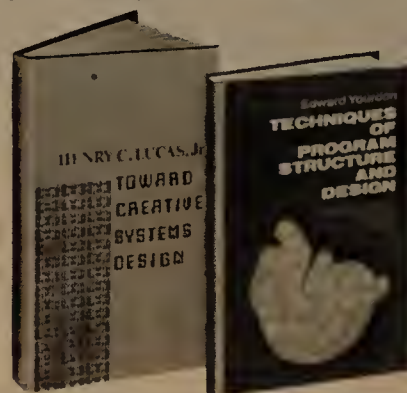


81880. SYSTEM ANALYSIS TECHNIQUES. Edited by J. Daniel Couger and Robert W. Knapp. How to properly evaluate an existing system, determine managerial information requirements, and assess the benefits of computerization of a management system. **\$15.95**

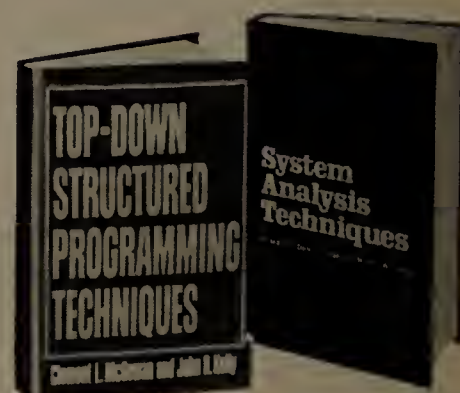
78335. SIMULATION USING GPSS. Thomas J. Schriber. The first thorough explanation of GPSS and its uses. Includes 27 GPSS case studies and over 300 problems which serve to clarify the step-by-step analysis of all the details of the GPSS language. **\$16.95**

41690. DATA PROCESSING ORGANIZATION AND MANPOWER PLANNING. Dick H. Brandon. Important techniques for manpower utilization and organizational development for use in data processing consultation. **\$14.95**

84430. TOWARD CREATIVE SYSTEMS DESIGN. Henry C. Lucas, Jr. Advocates a new user-oriented approach to the design and implementation of computer-based information systems. Demonstrates how users (rather than systems analysts) can design their own systems. **\$12.00**



82560. TECHNIQUES OF PROGRAM STRUCTURE AND DESIGN. Edward Yourdon. Lucid discussion of top-down structured programming. Over 300 illustrative problems, 90 valuable references, and four demonstration projects. **\$16.95**



59940. MANAGEMENT INFORMATION SYSTEMS. Paul Siegel. A wide-ranging and authoritative overview of MIS. Planning, forecasting, modeling, decision-making, establishing MIS roles, and implementation of MIS. **\$16.95**

84385. TOP-DOWN STRUCTURED PROGRAMMING TECHNIQUES. Clement McGowan and John R. Kelly. Lays out the basic theory and spells out the applications of this powerful new technique. Addressed to experienced programmers, it emphasizes guidelines, techniques, and actual code. **\$14.95**

56225. INTRODUCTION TO COMPUTER BASED INFORMATION SYSTEMS. J. Daniel Couger and Fred R. McFadden. 650-page volume on how to go about setting up a computer based information system. Covers important hardware and software concepts, data communication skills, system analysis and design techniques. **\$15.95**

IMPORTANT GUARANTEE! Examine your 3 introductory books for 10 days. If not delighted, simply return them and your membership will be canceled. You pay nothing, owe nothing.

MEMBERSHIP BENEFITS • In addition to getting three books for \$1.00 each when you join, you keep saving substantially on the books you buy. • If you continue your membership past the trial period, you will be eligible for our Bonus Book Plan—an important way to save even more, at least 70% off publishers' prices. • Your Book Club News, describing the coming Main Selection and Alternate Selections, will be sent to you 15 times a year at three to four week intervals. • If you wish to purchase the Main Selection, do nothing and it will be sent to you automatically. • If you prefer one of the Alternates or no book at all, simply indicate your decision on the reply form always enclosed with the News and mail it so we receive it by the date specified. • The News is mailed in time to allow you at least 10 days to decide if you want the coming Main Selection. If because of late mail delivery of the News, you should ever receive a Main Selection without having had the 10 day consideration period, that Selection may be returned at Club expense.

The Library of Computer and Information Sciences 7-7AD
Riverside, New Jersey 08075

Please accept my application for membership and send me the three volumes indicated, billing me only \$1 each. I agree to purchase at least three additional Selections or Alternates during the first 12 months I am a member, under the club plan described in this ad. Savings range up to 30% and occasionally even more. My membership is cancelable any time after I buy these three books. A shipping and handling charge is added to all shipments.

3 books for \$1 each.
Indicate by number the 3 books you want.

A few expensive books (noted in book descriptions) count as 2 choices

Name

Address

City State Zip

(Offer good in Continental U.S. and Canada only. Prices slightly higher in Canada.) Book selections purchased for professional purposes may be a tax-deductible expense.

School Days

Systems Analysis Workshop Set for D.C. Next Week

BETHESDA, Md. — Brandon Systems Institute, Inc. has revised the curriculum of its "Systems Analysis Workshop" and scheduled half a dozen presentations of the five-day course during the first half of the year.

The workshop will be held in Washington, D.C., next week; in New York City in mid-February; Atlanta, early March; Chicago, mid-April; Philadelphia, mid-May; and Kansas City in mid-June.

The course costs \$650, the registrar said from 4720 Montgomery Lane, Bethesda, Md. 20014.

Wharton Offers Sessions On Business Fundamentals

NEW YORK — DP managers may gain insight into the dollars and sense of their organizations by attending one of the three-day seminars offered this year by the Wharton School of the University of Pennsylvania.

Titled "Fundamentals of Finance and Accounting for the Non-Financial Executive," the seminars will be given in Houston later this month; in San Francisco in early February; in Atlanta in mid-February; in New York in early March; and in Phoenix in mid-March.

Cost of the course is \$495 per person plus \$50 for each organization. Detailed information is available from the Wharton Registrar, New York Management Center, 360 Lexington Ave., New York, N.Y. 10017.

DP Project Management Theme of Seminar Series

CHICAGO — The University of Chicago Center for Continuing Education has scheduled presentations of a three-day seminar on "Project Management for Computer Systems" in four different cities early this year.

The course will be given in Houston in early March; New York in late March; Los Angeles in mid-April; and here in Chicago in early June.

The registration fee is \$395/person plus \$50 for each organization represented, the spokesman said from 1307 E. 60th St., Chicago, Ill. 60637.

Datapro Reports

Users Put 38 Packages on Honor Roll

By Don Leavitt
Of the CW Staff

DELRAN, N.J. — Thirty-eight packages received high ratings from users surveyed recently by Datapro Research Corp. and were placed on its 1976 Software Honor Roll.

Each of the packages was rated excellent in the key category of overall satisfaction and good in a series of specific characteristics.

"The number of truly high quality software packages in widespread use has increased dramatically during the past year,"

Datapro said.

The latest honor roll is 50% longer than the one compiled in 1975, when 25 packages were listed. This increase occurred even though the criteria were the same in both years, according to a report published by Datapro last month.

Seven of the packages on this year's honor roll have been on the list four consecutive years, ever since it was established by Datapro in 1973.

In this elite group are Alltax from Management Science America; Disk Utility System, Westinghouse Electric Corp.;

DYL-250, Dylakor Software Systems, Inc.; Epat and Grasp, Software Design, Inc.; The Librarian, Applied Data Research, Inc.; and Panvalet, Pansophic Systems, Inc.

Another five of this year's honored packages have been on the list for three years. This part of the list included Fast/Dump/Restore from Innovation Data Processing, Inc.; Optimizer II, Capex Corp.; RPG-II (for 360/370), IBM; Syncsort, Whitlow Computer Systems, Inc.; and UCC I, University Computing Corp.

Appearing on the honor roll for the second year are Asap and Relo-Plus from Universal Software, Inc.; I130/Fortran and I130/Sort, both from DNA Systems, Inc.; IMSL Subroutine Libraries, IMSL, Inc.; the Teleprocessing Interface System (Westi), Westinghouse Electric Corp.; and Watfiv, University of Waterloo in Canada.

First-Time Winners

First-time winners start with CA-Sort II from Computer Associates, Inc.; Cytos, DNA Systems, Inc.; Dfast and Tfast, both from Oxford Software Corp.; Diopen, IBM; Diskplay, Boole & Babbage, Inc.; DYL-260, Dylakor Software Systems, Inc.; and Easytrieve, Pansophic Systems, Inc.

Others are Fmaint from Software Design, Inc.; IDMS, Cullinane Corp.; Image, Hewlett-Packard Co.; Look, Applied Data (Continued on Page 24)

Eclipse Cobol Brings Control To DP for Arizona Health Plan

BLOOMFIELD, Conn. — CG Medical Programs, Inc. (CGMP), a subsidiary of Connecticut General Life Insurance Co., became one of the first users of Data General's (DG) Cobol late last year.

It transferred the DP workload required by its Arizona Health Plan (AHP) activity from a number of outside service centers to an in-house Eclipse C/300 located in Phoenix.

CGMP estimated the changes made to its DP operations, including the purchase of DG equipment, resulted in a reduction of monthly costs to one-third of the projected expenditures for the current level of activity supported at the AHP.

AHP is a 35,000-member health maintenance organization (HMO) which handles 500 to 600 patient visits per day. Member data and visit-related data as well as business and accounting functions are performed using the DG computer equipment as one of the key support elements.

Before switching to the in-house system, CGMP data processing was fragmented among service bureaus, time-sharing services and a packaged patient records and appointment scheduling system at the Phoenix facility. The operations involved over 350 Cobol programs, all developed by CGMP.

These systems handled a variety of processing applications including revenue collections; claim processing; accounting functions for receivables, payables, payroll, budgeting and general ledger; inventory; appointments; laboratory tests; and patient medical history data. Other operating

requirements at these other facilities were accomplished manually.

To eliminate the loss of control and lack of security inherent in using several outside services and clerical systems and to increase the scope of automated systems in Phoenix, CGMP combined all the HMO data processing requirements into a single information management system.

Terminals on-line to the C/300 allow (Continued on Page 24)

Text Editor Update Dates Pages

PRINCETON, N.J. — The Extended Text Composer (ETC), a documentation or word-processing system originally part of the Autoflow II flowcharting package, is now available as a stand-alone product, according to its vendor, Applied Data Research, Inc. (ADR).

Version 6.0 also extends the features available in earlier releases of ETC, including the automatic creation of a table of contents and an index for whatever document is being created and a macro/shorthand facility said to be particularly useful in creating tables and graphs.

The enhancements include automatic update indicators which identify revisions to an existing document through special markings or, optionally, revised page dating, an ADR spokesman noted.

In addition, footnotes are put in place by ETC, which allocates page space and formats the footnote according to specifications after the user supplies the message at

each point of reference, he said.

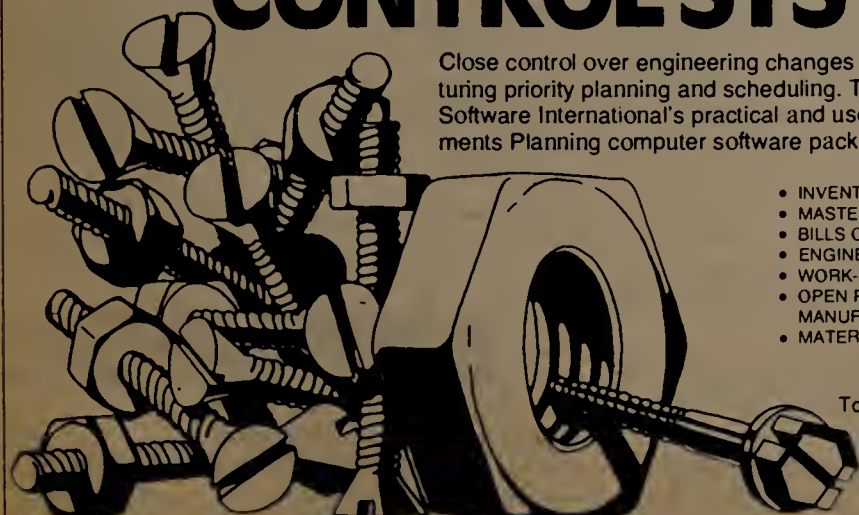
ETC now generates user-supplied messages as formatted page headings or footings and takes care of other things including elimination of "widow lines" in the finished document by adjusting page contents.

Output text can be organized for either alternating left- and right-hand pages or as right-hand pages only, ADR said.

Version 6.0 supports an overstrike capability which causes specified text to be printed in a darker, essentially "bold-face" type. It also includes several features to make the generated documents more comprehensible to international users, the spokesman noted.

The ETC update will be distributed to current Autoflow II users under the maintenance agreement. As a stand-alone package, ETC costs DOS users \$5,300 and OS users \$5,900, ADR said from Route 206 Center, Princeton, N.J. 08540.

PUT THE RIGHT PARTS IN THE RIGHT PLACE WITH OUR PRODUCTION AND INVENTORY CONTROL SYSTEM.



Close control over engineering changes and bills of material as well as manufacturing priority planning and scheduling. That's exactly what you get from Software International's practical and user proven Net Change Material Requirements Planning computer software package . . . with substantial support of

- INVENTORY MANAGEMENT
- MASTER SCHEDULING
- BILLS OF MATERIAL
- ENGINEERING CHANGES
- WORK-IN-PROCESS CONTROL
- OPEN PURCHASING AND MANUFACTURING ORDERS
- MATERIAL REQUIREMENTS PLANNING

To put your parts in the right place, put Software International's Production and Inventory Control system to work. Today.

I'd like to put it all together with your Production and Inventory Control System. Please tell me more ☐. Also tell me about your

- | | |
|---|---|
| ☐ General Ledger | ☐ Accts. Payable |
| ☐ Accts. Receivable | ☐ Payroll |
| ☐ S/3 General Ledger | ☐ S/3 Accts. Payable |

Name Title

Address Phone

City System

State Zip

**SOFTWARE
INTERNATIONAL®**

Elm Square, Andover, Mass. 01810 (617) 475-5040

New York (914) 332-0040 Chicago (312) 729-7410
Washington, D.C. (301) 770-6460 Philadelphia (302) 995-7101
San Diego (714) 292-9833 Toronto (416) 862-0521
Dallas (214) 233-5856

® Registered trademark of Software International Corporation

'Wylbur' Backs Both Interactive and RJE Operations

SAN FRANCISCO — Developed at the Stanford Center for Information Processing, the Wylbur text-editing and remote job entry (RJE) support system is now being marketed by On-Line Business Systems, Inc. (OBS).

While the developers had been distributing copies of the software to interested installations, the new arrangement should lead to a more standardized product with planned support for both customer problems and enhancements, OBS said.

Users of Wylbur can create, store and retrieve standard OS data sets on-line and interactively edit their contents, which may be source programs, documentation, cor-

respondence, test data or JCL statements, an OBS spokesman explained.

When JCL statements are under Wylbur, the software allows users to submit jobs to the host system for batch processing. They can then sample the results before authorizing printouts on either a remote or a central printer, he said.

Wylbur is said to be inexpensive to operate (in IBM OS and OS/VS environments), simple to learn and capable of providing "excellent recovery from system outages." It supports the range of IBM 2741- and Ascii-compatible terminals in either hard-copy or CRT versions.

In common with other software systems

that support on-line program development, Wylbur increases programmer productivity "sharply." Improvements "in excess of 25%" are "common," the vendor claimed.

Other development cost savings accrue from the ability to sample results and abort a compilation printout, for example, if

there are too many errors to make it worthwhile, the spokesman added.

A perpetual license for the basic Wylbur package costs \$17,500. Other terms, including lease, rental and installment purchase, are also available, he said from 115 Sansome St., San Francisco, Calif. 94104.

User Ratings Put 38 Packages On '76 Software Honor Roll

(Continued from Page 23)

Research, Inc.; and Minicom, Informatics, Inc.

Completing the list are SAS from SAS Institute, Inc.; Slick, NCI, Inc.; Software 1040, SAB, Inc.; SPSS from SPSS, Inc.; TLMS, Gulf Computer Sciences, Inc.; and Total, Cincom Systems, Inc.

'Systems' Packages Dominate

The 1976 Honor Roll was again dominated by "systems" packages as opposed to packages for specific applications, with 33 of the 38 products falling into the systems classification.

In 1975, 22 of the 25 packages were in the systems grouping, Datapro said.

Again, as in past years, most of the products on the honor roll were "relatively simple . . . with straightforward functions," Datapro said.

On the other hand, three "more complex, multifunction" data base management systems — IDMS, Image and Total — made this list, it added.

Burroughs' DMS-II achieved honorable mention with high ratings, but not enough users to qualify for full honors.

Six Ratings Needed

The number of ratings needed is only six. Although this has been criticized by some as the weak point in the honor roll qualification process, 23 of this year's winners

would have been on the list even if the required number of ratings had jumped to 18, triple the current base.

Panvalet garnered 172 ratings and three others had more than 100 users evaluating them. Another eight had 40 or more ratings, Datapro noted.

Five packages — IDMS, CA Sort II, Cytos, DYL-260 and Fast/Dump/Restore — shared top rating honors, each earning weighted average ratings of 3.8 out of a possible high of 4 in overall satisfaction.

Complete results of the 1976 user survey and the researchers' analysis of the results are in the feature report, "User Ratings of Proprietary Software," available for \$12 per copy from Datapro, 1805 Underwood Blvd., Delran, N.J. 08075.

This New Infopac™ Is So Reliable It Carries a One Year Warranty



Completely self-contained including the solid-state memory, the only moving parts are the data entry and function keys—and the entire Terminal is rated for 15,000 hours of operation MTBF (Mean Time Between Failure).

This all-new Infopac offers over 70 standard and optional features, and so can be configured to meet the requirements of every application for portable data collection and entry systems—and with the assurance of a long and trouble-free life.

Fully described in our literature, and yours for the asking.

INFOPAC™

AzurData Incorporated
1305 Mansfield Ave., Richland, WA 99352
(509) 946-5161

Offices and Representatives
in Principal U.S. Cities, and Overseas



**BEEHIVE
INTERNATIONAL**

Just one of the many leading companies you'll see at

**COMPUTER
EXPO 77**

Beehive's recently introduced B100 and B500 video display terminals will be featured with their "B" Series product line during the Computer Caravan. The B100 combines a low cost and numerous features and options, while the microprogrammable B500 accents an expandable memory.

Organized by:

**COMPUTER
CARAVAN
77**

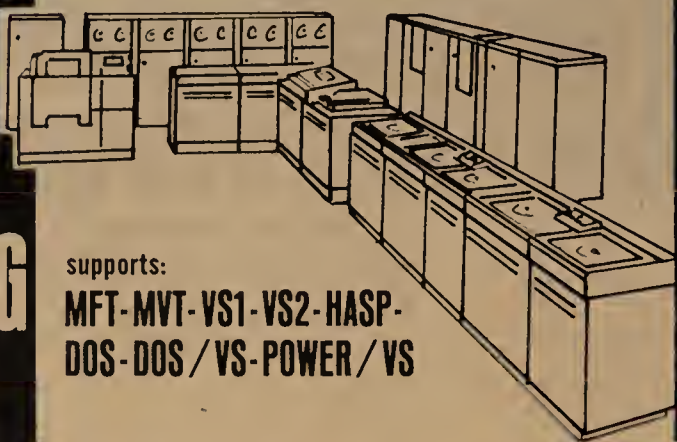
The national computer exposition that's coming to you.
797 Washington Street, Newton, MA 02160
(617) 965-5800.

San Francisco • Los Angeles • Cleveland • Minneapolis/St. Paul
Chicago • New York • Philadelphia • Washington, D.C. • Boston. Starts March 29th.

**OVER 700
DP
Managers
now use
the
JOHNSON
JOB
ACCOUNTING
REPORT
SYSTEM**



■ Accurate Job Accounting ■ Continuous Performance Measurement ■ Equitable Cost Distribution ■ Optimized Software Performance ■ Accurate Customer Billing ■ Realistic Thruput Analysis ■ Optimum Resource Utilization



supports:

MFT-MVT-VS1-VS2-HASP-
DOS-DOS/VS-POWER/VS

JOHNSON SYSTEMS INC.

8400 Westpark Drive, McLean, Virginia 22101

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

CITY _____

STATE _____

ZIP _____

PHONE _____

COMPUTER _____

OPERATING SYSTEM _____

Send for
FREE
30 Page System
Characteristics
Manual

Eclipse Cobol Eases DP Work in Arizona

(Continued from Page 23)

physicians and other medical staff members to access each member's medical data. They can also retrieve reports from a comprehensive data base of supporting medical care information like unusual test results, drug-related data, disease classifications and prior programs of medical treatment.

Cobol batch programs manage administrative tasks and cost control functions. The on-line patient data retrieval operation is backed up by an Eclipse S/200 computer because of the critical nature of the data stored on the computer files.

The HMO is in operation 24 hours a day every day of the year and access to member data is maintained at all times through the use of switching devices and the backup machine.

CGMP chose the Eclipse systems to run its information management system because of its ability to run existing packaged programs and handle an ever-increasing workload of patient data, according to Robert L. Smith, who was in charge of the conversion effort.

Another significant consideration was the availability of a high-level Ansi-74 Cobol compiler and telecommunications software support, he said. The software features contributed greatly to reducing the manpower requirements in converting the large library of Cobol programs.

The telecommunications software enabled CGMP to speedily implement the on-line terminal portions of their systems, Smith added.

Compatibility with various data storage media permitted a simple transfer of data files from the various support services to the DG equipment, he concluded.

Understandable, User Says

Software Physics Shows Managers What's Happening

By W. Kemp Clawson

Special to Computerworld

"How much more work can we do on our computer?" This question, asked often by executive management, has been difficult to quantify and answer in the past.

By employing software physics, however, we at United Virginia Bankshares (UVB) have now overcome this problem and gained new insight into the usage of our computer system.

UVB's executive level (non-DP) management requests a formal quarterly report on computer resource usage so it can make decisions concerning the budgeting of these resources. Since these men are primarily bankers and financial managers, the report must be presented in a fashion that they can relate to and understand.

This certainly precludes the use of such metrics as buffer hit ratios, channel busy time, or paging rates.

In addition, our report must be as accurate as possible with few or no "educated guesses." Thus we need a methodology that is accurate and "reportable" and provides the necessary management and technical information.

Studies Performed

In practice, two separate studies are performed. One uses IBM's System Management Facility (SMF) data and our operation's schedule to determine the tape and disk drive usage. The other uses software physics to address the kinetics of the computer system (or in software physics jargon, work).

This second study is the newest and most important to us since it centers on CPUs, channels and I/O controllers.

What is "work"? Inherently, everyone understands the concept of work and uses it (remember our beginning question?). More specifically, however, in a computer system work can be thought of as one byte (or character) of data moved or acted upon.

For example, a 1,000-byte record transferred across an I/O channel would be considered 1,000 works performed (or one kilowork, KW).

To be useful, however, the work must be analyzed by each equipment class (e.g., CPU, disk, tape, printers) in several ways — by the work done each hour of the day; by the work done by each application; and, finally, by the work done by our entire workload.

Additionally, so that we may relate this to our potential, we must compute our configuration's work capacity (again by equipment class).

From this data we derive the following information:

- A schedule, by hour and equipment class, showing work done and the capacity to do work.
- The configuration's work characteristics.
- The workload's work characteristics.
- Applications work characteristics.

This hourly schedule helps identify bottlenecks in time and equipment and show where reserve capacity exists. It may also be used for rescheduling work in order to better utilize our configuration. Knowing both the configuration and workload characteristics, we are now able to determine if our computer system is configured optimally for our work.

If not, this analysis indicates what equipment needs to be adjusted by either adding or removing capacity. If a certain application needs to be speeded up, then this same analysis is made comparing the application's characteristics with the configuration's.

Another use of this information is forecasting future configuration requirements.

We can further distinguish between direct (applications) and indirect (operating system) work, with their sum being the total work done. The indirect work data can be

very valuable in analyzing such effects as paging in a virtual environment (with respect to resources used).

'How Much Capacity?'

Armed with this information, we can now proceed to consider the "How much capacity?" question.

That question is, unfortunately, much too general to answer at this point, but we can answer specific questions concerning our capacity to handle new applications (or increased transaction volumes) during a specified time period (our processing window). This, after all, is what we really need to know: "Can application X be added and executed in the necessary time?"

Using one of several techniques available, we can forecast the work requirements by equipment class with reasonable accuracy

($\pm 5\%$). Now it is a simple matter to see if we have the capacity to perform this work, during the time specified, from our hourly schedule.

In practice, our quarterly report contains the hourly schedule of capacity and work done, trend information and a discussion of any exceptional circumstances about which management should be informed.

The next part consists of specific questions concerning new work which the computer performance evaluation (CPE) analyst answers after computing the new work and its characteristics.

Of course, if applicable, further analysis would be undertaken to determine new equipment demands if the present capacity is not sufficient.

The final product is reasonably short and necessitates a minimum of computer tech-

nology in its presentation.

As a result, management now understands our utilization report and has a quantifiable, structured approach to budgeting computer resources. The CPE analyst likewise is now very organized in his perception of capacity usage and reaps the following benefits from this approach:

- Current configuration's capacity.
- Configuration/workload tuning data.
- I/O subsystem efficiency data.
- Means to evaluate changes in hardware/software.

The use of software physics at UVB, although just beginning, has already gained management's acceptance and interest. For us, in our environment, software physics has proved to be invaluable.

Clawson is a CPE analyst with United Virginia Bankshares in Richmond, Va.



It's a keypunch.



An intelligent terminal.



An online card punch.



A data editing system.



A programmable microprocessor.



It interfaces...

If your computer installation uses punched cards, your card preparation costs probably consume a higher percentage of your data processing dollar than they should. It's time you looked at the latest generation of card handling equipment.

Because a keypunch is no longer just a keypunch. Not if it's a Tab Product Model 501. We've used the latest microprocessor technology to meet all the input/output requirements of your card-oriented applications in a single economical unit.

Standalone, the 501 is a rugged, fully buffered keypunch, built for heavy duty commercial keypunch applications. And so quiet you'll know immediately that this is no ordinary keypunch.

But the 501 is much, much more. It communicates on-line with your mainframe CPU or minicomputer system. From the computer room or across the country on a dial-up line. So you can use it as an economical output card punch. And a data input and editing terminal.

The 501 can be all these things because it's not just another 'dumb' peripheral.

Programmability not only provides the data editing power you need at the source,

but gives the 501 the flexibility to change with your requirements. Just plug in a different PROM to add an editing feature, change your check digit calculation, or perform a special data input function unique to your application. All programmed—and supported—by Tab Products to your own requirements.

Until now, you had to change input media in order to experience the convenience and economy of distributed processing. And sacrifice the unique advantages the punched card provides for users throughout business and industry.

Sure, it's a keypunch. But it's a lot, lot more.

For more information, write or call Robert E. Nadal, National Marketing Manager, Tab Products Company, 2690 Hanover Street, Palo Alto, California 94305 (415) 493-5790



It's a Tab Products' 501.

TAB
PRODUCTS CO

'Intertest' Aids CICS Sites

HACKENSACK, N.J. — Interactive Test Controller (Intertest) is a program product which the vendor, On-Line Software International (OSI), described as a means to simplify and accelerate testing and debugging interactively in an IBM Customer Information Control System (CICS) setting.

Previously available techniques assisted the CICS user in diagnosing what happened after a system crashed.

Intertest reportedly prevents crashes, informs the user "what would have happened" if it had not taken corrective action and produces diagnostic information which eliminates dump analysis procedures, according to a spokesman.

Monitoring under the OSI package can be activated at the program, transaction or terminal level or on all applications within the system, he said.

The user may also work with a pro-

gram flow trace option or set breakpoints to check intermediate data fields and other indicators midway through program execution, he added.

To use Intertest, the system program can prepare tables identifying such things as the number of items that may be controlled simultaneously; the program, transactions and terminals that should be monitored automatically; and options that are to be applied to each controlled item.

The tables can also show items that are to be excluded from Intertest's control.

The test/debug software supports all languages suitable for use with CICS (or CICS/VS).

Intertest is available for \$6,500 and there are leasing and rental arrangements, the spokesman said from 411 Hackensack Ave., Hackensack, N.J. 07601.

Files Moved From Disk to Tape Under 'UCC Three' User Control

DALLAS — UCC Three-Adam, the disk management system from University Computing Co. has been enhanced, according to the firm.

A "migration" feature has been added which transfers data from disk to tape storage under control of user-selected criteria.

The basic package controls new data set placement on disk and enforces direct access storage device (DASD) usage standards before they are violated.

By identifying invalid and unneeded data sets, UCC Three-Adam enables the user to remove them on a timely basis, UCC said.

The migration feature extends that facility so that disk-based data sets which exceed criteria named as part of the Sysin input,

are shifted to less critical tape for storage.

The user is free to name almost any criteria as the basis for transferring data to tape. Typically, size of a data set or the last date it was used might be the trigger, but users may also combine requirements to make the migration more selective, UCC said.

With the feature, failure of regular production jobs because of an apparent lack of disk space is "significantly reduced." This, in turn, may delay the date when more hardware is needed.

UCC Three-Adam functions in IBM OS, VS and MVS environments.

The package is available under a permanent license for \$15,000, but monthly payment plans are also available.

UCC is at 8303 Elmbrook Drive, P.O. Box 47911, Dallas, Texas 75247.

MRP Runs Packaged For Datasystem 350

SKOKIE, Ill. — The Material Requirements Planning (MRP) package that processes a level-by-level scheduling and shortage reporting system, utilizing a bill of materials control routine, on Digital Equipment Corp. Datasystem 350s is now available from J. Baker & Associates, Inc.

The system is presently operating on a 22,000 item inventory with more than 60,000 bill of material relationships and as many as 56 levels of explosion, according to a Baker spokesman.

Reports generated by the system are said to include item lists with codes and costs, bills of material with costs and indented bills of material showing subsidiary relationships.

"Where Used" listings and stock status reports describing options are also provided, he said.

The system reports, level-by-level, customer orders prior to their explosion to the parts level.

It also documents shortages for both manufactured and purchased parts and components so that management can act before the shortages cripple the user's operation, the spokesman explained.

The package is available for \$7,500 with modifications, if any are needed, at additional cost, Baker said from Suite 106, 5135, W. Golf Road, Skokie, Ill. 60076.

Marketing-Minded OEMs Wanted

We're looking for a few firms who will take our best-on-the-market telephone call accounting equipment—add software, hardware, service and maintenance—then present the package to business phone users.

The market for this system is big and it's growing. Business telephone expenses now rank number three behind payroll and rent.

Any company spending \$5,000 a month or more on their phone bill can expect to save 10% to 40% through effective management control. Our PBX telephone call accounting system develops the accurate, reliable data needed to show them just how to do it—by making the best use of WATS, FX and tie-lincs, by plotting traffic patterns, by developing accountability for individual extensions, by cutting phone abuse—and a

number of other ways to fine-tune a phone system and trim waste.

We've served the telephone industry for over 25 years and our reputation is one of the best. We want OEMs who will give the kind of service that Alston has built its reputation on.

We offer you systems expertise, technical and sales training and advertising and promotional support.

The opportunity is here. If you think it might be right for your firm, we'd like to talk with you.

Write or call Doug Swain immediately.

ALSTON®
TELEPHONE DATA SYSTEMS
1724 South Mountain Avenue
Duarte, California 91010
Tel: (213) 357-2121

CONRAC
CORPORATION



Resolve™ stops IPLs and downtime dead in their tracks.

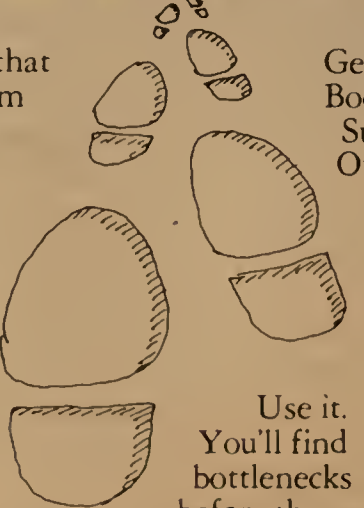
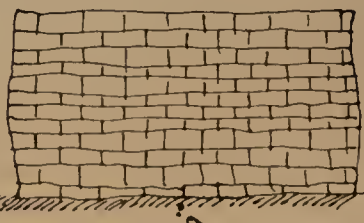
One of the reasons they made you a manager was your ability to know when the system was slowing down, operating inefficiently, or on the verge of crashing.

Now there's a diagnostic product that gives more warning than you get from the pit of your stomach.

It's RESOLVE.

RESOLVE is a real time, on-line problem solver that flags (and shows you how to reduce) enqueue conflicts, reserve lockouts, paging thrashing, job looping, in wait states, and jobs hung up in the system.

RESOLVE provides more than 40 operator and authorized TSO user commands. Each one addresses a system problem that can cause lost time or IPLs.



Use it.
You'll find bottlenecks before they stop the clock. And you'll also pick up system

productivity.

More work through the machine. Fewer IPLs. Better management. It all comes from RESOLVE.

Information about RESOLVE is available in writing or over the phone.

Get one or the other when you contact us.
Boole & Babbage Inc., 850 Stewart Drive,
Sunnyvale, CA 94086; (408) 735-9550.
Outside California dial toll free 800-538-1872.

Boole & Babbage

Dear George: Sure, I'm a manager, and it looks like RESOLVE will help me manage in real time, on-line. Better get the whole story to me before the boss finds a clairvoyant for my job.

Name _____ Title _____

Company _____

Street _____

City _____ State _____ Zip _____

Phone _____ My System: _____

☐ Information Only ☐ Send me the package for a free 21-day trial. If I like it, I'll buy it.
☐ I'm an MVS user, send me information on RESOLVE-MVS

Want to know why
Western Auto
is so great?

ASK A
WESTERN
AUTO
DEALER



We'll send you the
names of dealers
near you.

Makes sense doesn't it? Talk face to face with someone who's really running a Western Auto Store. And get the straight story.

Ask them about our help with town and site location. • About store planning and display. • About our retail training program. • About our 40 years of serving Western Auto Associate Stores. • About how we may be able to help with financing if you qualify. • About the support and assistance of Western Auto people. • About how we have no franchise fee, contract fee or sales royalty.

For the names of Western Auto dealers near you, or free booklet on the Western Auto plan, call TOLL FREE day or night 7 days per week

1-800-821-7700 Ext. 818

Missouri Residents Call 1-800-892-7655, Ext. 818—for action today.

Mail to: R. T. Renfro, V.P.,
Western Auto,
2107 Grand Avenue,
Kansas City, Mo. 64108

I'd like to know more about owning my own Western Auto store. Please send free information.

Name _____

Address _____

City _____ State _____ Zip _____

Phone _____ ComWorld 1/77

WESTERN AUTO

OVER 4,000 ASSOCIATE STORES IN 40 YEARS



“MARK IV® has been everything it was billed to be...”

A testimonial by Jack Moran, Corporate DP Manager, Butler Manufacturing Company,* Kansas City, MO.

“If I had to select the one thing I like best about MARK IV, it would be the obvious productivity improvement we’ve enjoyed. Today we’re doing everything we were doing in 1970 when our programming staff was 40% larger.

“We have a 370/145 running five to six thousand jobs a month, three shifts a day, with a large teleprocessing requirement. The primary payoff we were after was in manufacturing applications, including order entry, order processing, and material and inventory control, as well as spin-offs in accounts receivable, sales analysis and general accounting. The majority of these systems, representing about 75% of our total processing load, are now in MARK IV.

“An important part of the MARK IV selection process was an evaluation of Informatics as a supplier. How competent were their support personnel? How timely and well-tested were their product updates? How effective were their educational offerings? In all these areas we evaluated Informatics to be superior to their competition.”

WHAT IS MARK IV? MARK IV is the most versatile and widely used software product in the world for application implementation, data management and information processing. Six powerful models (with prices from \$12,000) are in use on IBM 360/370, Univac 70/90, Sie-

mens 4004 and Amdahl 470 computers at over 1,000 installations in 43 countries. Programs in MARK IV require only about one-tenth the statements of Cobol, and users report 60% to 90% cost and time reductions on most MARK IV applications. Send the coupon today for detailed information.

informatics inc.  **Software Products**

**Butler Manufacturing Company is the leader in the pre-engineered buildings industry.*

Informatics Inc., Software Products, Dept. CW117
21050 Vanowen St., Canoga Park, Calif. 91304

Name _____ Title _____

Dept. _____ Computer _____

Firm _____

Address _____ Phone _____

City _____ State/Province _____ Zip _____



DECwriter II puts the acoustic coupler back where it belongs.

Built right in.

Not on the floor, not on a table, but back where it belongs. Gone is all the irritation of using a stand-alone acoustic coupler. Because ours is designed in, not added on.

But convenience isn't the whole story behind our acoustic coupler.

We tested it, under the worst sort of factory noise conditions, and found that it performed better than the largest selling model.

And since our new acoustic

coupler has just a single electrical connector, it's as simple to install as it is to use. It doesn't need an EIA interface.

Best of all, it is priced to compete with stand-alone units.

It's also nice to know that if something should ever go wrong, you can turn to a single source for service. Us.

The DECwriter II with built-in acoustic coupler.

The world's most popular 30 CPS keyboard terminal has just made long distance communication a simple reach away.

For more info, call 800-225-9480. Or write: Components Group, Digital Equipment Corp., One Iron Way, Marlborough, MA 01752. Canada: Digital Equipment of Canada, Ltd. Europe: 81 Route de l'Aire, 1211 Geneva 26, tel 42 79 50.

digital
COMPONENTS
GROUP

Because of Increased Tariffs

Daily Eager to Swap Dataspeeds for Less Costly CRTs

By John P. Hebert
Of the CW Staff

WATERTOWN, N.Y. — Writers and editors at a daily newspaper here hailed the installation of AT&T Dataspeed 40 terminals at all bureau offices in 1975 as a "brand new ball game" in news copy transmission.

But now they are not hesitating to replace the units with less costly CRTs because of vastly increased hardware tariffs for the Dataspeeds imposed last year by the N.Y. Public Service Commission.

Although eight Dataspeed 40s saved \$9,000 last year in the cost of news trans-

mission for the *Watertown Daily Times*, the rent hike of \$100/mo for each of the tariffed units will cost the newspaper \$9,600 more each year, according to John B. Johnson Jr., managing editor.

The Dataspeeds had replaced a network of Teletypes late in the summer of 1975. Transmission costs dropped from \$28,000/year to \$19,000/year, daily production times dropped and copy errors were also reduced from utilization of the AT&T CRTs, Johnson said.

Earlier this year, however, the hardware costs for the terminals increased to \$250/mo, making them less cost-effective

for the 40,000-circulation paper, he indicated.

The *Times* decided to replace the Dataspeeds last month and will soon install one Teleram Communications Corp. P-1800 CRT at each of its eight news bureaus and will purchase another for backup, according to Johnson.

Johnson said the Teleram units with 180K-character storage will cost \$5,000 apiece, will pose few changeover problems for the computer-based paper's operations and will pay for themselves in two years.

The *Times* would have stayed with the Dataspeeds if they had remained price-

competitive, Johnson pointed out.

The N.Y. Public Service Commission's year-old decision may cause wholesale defections in the state's Dataspeed 40 user ranks, which include the N.Y. State Police, he added.

Used to Cut Time

The Dataspeeds have been used at the *Times*' news bureaus in N.Y. and Washington, D.C., to cut the transmission time to the composing room here from one hour to less than 20 minutes.

"We used to run about 40 to 50 minutes of telephone calls between our Washington bureau and Watertown every night. With the Dataspeed 40 terminal, we move all the news in less than three minutes," Johnson said, adding the AT&T terminals worked at 1,200 bit/sec speeds.

Information from the terminals are captured on paper tape on an IBM 7 which is tied to all the newswire and sportswire services, Johnson explained.

Incoming news copy is transferred to IBM 3270 CRTs for editing, rather than dealing with paper and pencil editing, and sent back to the 7, which outputs the copy to an IBM

(Continued on Page 30)

Codex Monitor Supplements Diagnostics

NEWTON, Mass. — Codex Corp. has introduced the Circuit Quality Monitoring System (CQMS) which is said to implement for the first time advanced concepts of data network monitoring in a standard product.

The microprocessor-based monitoring unit supplements the normal diagnostic

are exceeded, he explained.

CQMS monitors line parameters including amplitude modulation, phase jitter, harmonic distortion, band-edge distortion and noise. It provides an LED output at threshold levels.

A second function of the system is the ability to count parameters such as phase hits, gain hits, line dropouts and modem retrains. Hit counts are stored and can be displayed on the unit's digital readout, the spokesman said.

These hit counts can be continuous or programmed for a 15-minute interval for comparison with Bell practices for line performance, he noted.

Several display functions are available with the device, including modem Eye Pattern and a Tap Coefficient display which provides a visual indication of line amplitude and delay distortion characteristics, he said.

These distortion characteristics were previously determinable only from extensive off-line testing, Codex claimed.

CQMS also has the capability to store and provide replays of the modem Eye Pattern for real or "imaginary" error signals and amplitude and phase error signals for unattended disturbance recording, the spokesman noted.

These circuit quality display functions are combined in the unit with a digital readout decibel meter, audio monitor and a modem test set, he said, noting these functions can be utilized for other manufacturers' modems.

The rack-mount CQMS has inputs for four modems and can be expanded with the

optional CQMS input selector which handles 16 Codex LSI modems, Codex said.

The system allows utilization of up to four input selectors to monitor a maximum of 64 modems at speeds up to 9,600 bit/sec, the company added.

The CQMS costs \$5,750 or \$190/mo on a two-year lease from Codex at 15 Riverdale Ave., Newton, Mass. 02195.

Perkin-Elmer Enters CRT Arena

RANDOLPH, N.J. — Perkin-Elmer Data Systems has introduced two microprocessor-controlled CRTs for users who need asynchronous, Ascii-oriented terminals.

Designated the Fox-1100 and the Owl-1200, the terminals are said to offer more features at a lower price than similar devices previously available. The lower cost is tied primarily to the use of a Motorola

6800 microprocessor, according to a spokesman.

The Fox-1100 is described as a teletype-writer replacement device for time-sharing and other interactive applications. It includes upper and lower case and an optional buffered printer port that can handle print speeds up to 960 char./sec, the spokesman said.

The 24-by-80 character display includes 9 by 12 dot matrix characters with lower-case descenders. A Typamatic repeat feature allows any key to be repeated if it is held down for longer than one-half second, he noted.

A transparent mode allows all characters, including control codes, to be displayed for program debugging. Also, the host mainframe can ask for mode status which will provide the position of all mode switches on a terminal.

The Owl-1200 is designed for transaction processing, inquiry/response and data entry applications and is said to provide a full editing display.

Like its 1100 counterpart, the 1200 has the

(Continued on Page 31)



Codex CQMS

functions included in Codex's LSI Series modems, providing the network operator with a visual analysis of line operating parameters without interruption of data transmission, the firm claimed.

The CQMS is designed to operate with the Codex LSI series and relies on a microprocessor to perform a continuous analysis of the modem received signal in such a way that line disturbing effects are identified and displayed, according to a spokesman.

Actual signals received are compared by the CQMS against ideal values. The pattern of these variations is compared with stored algorithms, he said.

Once a disturbance pattern is recognized, the unit will display the presence of the disturbance when preestablished thresholds



Fox-1100, Perkin-Elmer's First CRT

terminals

digital

☐ LA-36 DECwriter II
\$1650 \$59/mo*

LEAR SIEGLER

☐ ADM-1 \$1550 \$56/mo*
☐ ADM-2 \$2495 \$90/mo*
☐ ADM-3 \$ 995 \$36/mo*

TEXAS INSTRUMENTS

☐ 733 KSR \$1550 \$56/mo*
☐ 743 \$1350 \$49/mo*
☐ 745 \$1950 \$70/mo*

Diablo

☐ Hyterm \$2990 \$108/mo*
☐ 933 \$2850 \$103/mo*

TELETYPE

☐ 33 KSR \$ 895 \$32/mo*
☐ 33 ASR \$1278 \$46/mo*
☐ TWX/DDD \$1749 \$63/mo*

Terminal accessories

☐ Acoustic couplers ☐ Digital cassette recorders ☐ Modems ☐ Supplies

Check items of Interest and return to us for more information

COMDATA

8115 Monticello Skokie IL 60076
Tel. (312) 677-3900 TWX 910-223-3617 member of IDCMA

name _____

company _____

street _____

city _____ state _____ zip _____

telephone _____ ext. _____

*3 year lease with purchase option

Daily Anxious to Replace Dataspeeds

(Continued from Page 29)

1130 for printing hyphenation and column justification, Johnson continued.

The 7 is essentially an I/O device for the *Times'* IBM 3/15 CPU, he said.

Eliminated Incorrect Messages

"Because of its highly developed editing capability, the Dataspeed 40 virtually eliminated incorrect messages, avoided inaccuracies and stamped out misspelled words," Johnson said.

"The simple and straightforward operation cleared the way for rapid editing — replacing, deleting and inserting characters or lines," which helped cut down the cost of human error, he added.

And although editors and reporters regard the terminal as 12 times faster than the teletype-writers they replaced, Johnson noted the Dataspeed's 1,200 bit/sec operation is wasted on a two-minute minimum line charge.

The Dataspeeds completed calls in less than 25 seconds, he explained.

While the Telerams operate at a slower 300 bit/sec transmission speed, Johnson expects no extra charges because transmission times will fall within the 120-second minimum duration.

In addition, there will be "no great loss of capabilities" with the Teleram CRTs and the *Times'* programming staff will only have to make "small programming changes" to bring them up to what Johnson hopes will be the level of the Dataspeed capabilities, he stated.

Johnson said he looked at other comparable terminals before opting for the Teleram's, but indicated there were fewer needed features. He added he couldn't identify the competing devices by name.

Johnson also said he was happy with the AT&T devices before the price increase, which he believed "was not AT&T's fault."

Prior to the installation of the Dataspeed terminals, teletype-writers in the *Times'* bureaus transmitted via dedicated lines.

The speed of transmission in that manner was dependent to a large degree on the typing and writing ability of the reporter composing the story, Johnson said.

Access to the teletypewriter was often a lengthy process, especially when reporters filed unusually long articles, jamming the telephone lines and denying other news bureau reporters entry to the same lines, he continued.

"The correspondents remained on the line as long as it took them to write their pieces, Johnson recalled.

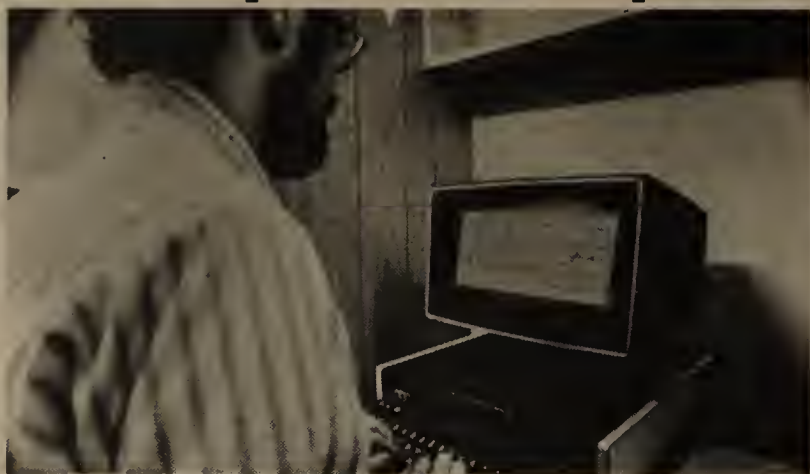
Comdata Package

Includes TI Teleprinter

SKOKIE, Ill. — Comdata Corp. has offered a Texas Instruments, Inc. 743 printer terminal and its own Model 150 acoustic coupler in a suitcase-like package.

The terminal/coupler/case combination permits shipping as baggage; and space is provided in the case for paper, pencils, etc., according to Comdata.

The case with components weighs 17 pounds and costs \$1,685 from the company at 8115 Monticello, Skokie, Ill. 60076.



Bureau reporter files story on Dataspeed 40.

Event Counter Monitors Nets

INDIANAPOLIS — Although Esterline Angus Instrument Corp.'s event counter and time totalizer is primarily intended for industrial machine networks, it reportedly can be used to monitor data communications channels and computer networks.

The Model DE 2100 key-programmable data acquisition system allows the user to assign event-counting instructions to any one of a minimum of eight to a maximum of 248 data channels.

The counter has isolated inputs for connection to a modem output pulse or "carrier on" switch and comes with RS-232 interface.

A multifunction-key keyboard, numeric pad, integral printer and memory-save feature are standard with the device, which permits a maximum of 10 event/sec to be monitored.

An eight-channel counter costs \$3,750 while a 32-channel version is priced at \$4,275. Deliveries will begin in March; Esterline can be reached at P.O. Box 24000, Indianapolis, Ind. 46224.

Reality is the sweet smell of success.

Denver Wholesale Florists Co. is America's largest distributor of fresh cut flowers. During peak periods they may ship nearly two million roses and carnations a day all over the world.

They needed a small business computer with big power to do their order billing. They chose a Reality™ data base management system. Because in their application no other small business computer in the world could face up to Reality. For power or for price.

Reality gives up to 32 independent users an awesome amount of computer power for the money. And it's the only computer system in the world that understands English™.

For Denver Wholesale Florists Co., Reality up-dates the customer and supplier lists on-line. It automatically up-dates all records when a change or addition is made anywhere in the system.

Reality does routing, invoicing, standing order processing, shipping manifests, customer labels and shipping orders. It tells them what's on order for any customer on any given day. It helps the credit department keep track of credit problems, extensions and COD orders. It captures sales and accounts receivable data.

Denver Wholesale Florists Co. can add payroll, accounting and general ledger to the system and still not use all its power.

Whether you're cutting flowers or cutting corners, Reality gives you control.

It's not surprising. Reality is brought to you by Microdata. A major supplier of sophisticated equipment for the small business computer market.

Contact your local Reality dealer for a free demonstration. So the sweet smell of success can be a reality in your business.

Or write Microdata Corporation, 17481 Red Hill Avenue, Irvine, CA 92714, P.O. Box 19501, Irvine, CA 92713, TWX: 910-595-1764.

Microdata

The people who bring you Reality.

Conversion System Eases Transmission

FAIRFIELD, N.J. — An IBM-compatible system for moving magnetic card data to paper tape simplifies the conversion of data which is designated for transmission via Teletype or Telex, according to its vendor, Tycom Systems Corp.

The system can be useful to international corporations when a portion of data stored on magnetic cards as part of their word-processing operations must be transmitted over communications lines, Tycom said.

Included in the conversion system are the Tycom paper tape reader/punch (PTR/P) module and the Tycom IBM-compatible MCST magnetic card reader/writer module with electronic interface, according to a

Tycom spokesman.

Although the PTR/P is inherently oriented to Ascii, any code can be accommodated, he claimed. Programmable code translation from one code to another is accomplished with a code converter built into the system.

The module will duplicate or transpose tapes at a maximum of 50 char./sec. With a special editor option, the tapes can be read or skipped by character, word, line or paragraph, he said.

The reader/writer module is reportedly suited for users who wish to read or write magnetic cards derived from or prepared for the IBM MCST.

The magnetic card module provides a

connection to RS-232 interface for the Tycom input/output IBM Selectric type-writer as well as Tycom's PTR/P module, the spokesman noted.

Magnetic cards generated by an IBM MCST can be read by the reader/writer module which converts all codes to Ascii and outputs all signals through the RS-232 port provided with the module, he said.

The user may select any three speeds from 75-, 110-, 134.5-, 150-, 300-, 1,200- and 2,400 bit/sec. Parity is switch-selectable from even, odd or none, according to the spokesman.

The conversion system is priced at \$8,500, he said from 26 Just Road, Fairfield, N.J. 07006.

Dynatech Labs Fallback Switcher Provides Dial-Up Accessibility

ALEXANDRIA, Va. — Dynatech Laboratories, Inc. has added a dial-up access fallback switcher to its line of data communications control equipment.

The switcher provides A/B switching, remote modem substitution and remote dial backup for up to 64 on-line communications devices in groups of two, according to a Dynatech spokesman.

Available in 2- to 16-channel versions, the unit provides fallback switching of the RS-232 interface on an individual channel basis or on a group channel basis. For each channel, switching is between two modems and a terminal or computer port, between two terminals or ports and a modem or between other digital interfaces, he explained.

The fallback switcher is capable of handling data up to 9,600 bit/sec. It interfaces with a standard voice-grade telephone line

and Bell Touch-Tone telephone through a voice-coupling access arrangement (VCA).

Typical applications include system reconfigurations, bypassing of failed equipment or circuits and remote switching for testing and diagnostic purposes, Dynatech said.

Answer-back tones from the device provide identification of switching action. The switcher is accessed after dialing its assigned number. Failure to enter security codes causes automatic disconnect, according to the firm.

Options include a phone jack and push-to-talk handset for two-way voice communications, LED "carrier" indicators and carrier lost alarms, the spokesman noted.

The price for an eight-channel switcher is \$2,700, he said from Dynatech at 900 Slaters Lane, Alexandria, Va. 22314.

Perkin-Elmer Unveils First CRT Terminals

(Continued from Page 29)

Typamatic keyboard capability for character repeat, but also includes an optional X-Y coordinate line drawing capability and a polling select option for multidrop communications, according to the spokesman.

The line drawing option is said to permit display of source document images designed to speed operator training and reduce input errors.

Field attribute controls of the Owl-1200 include inverse video, half intensity, blink, protected, numeric only, nondisplay and modified field definitions, he said.

The terminal's editing features are insert/delete character or line, clear screen, clear unprotected and clear line/field.

Easier Programming

Programming of the host CPU is reportedly easier with the 1200 because the host can "ask" for mode status position of mode switches.

In addition, SEND keys can be programmed to send all or part of the screen data, or programmed to send only a "request to send header," the spokesman said.

The Owl terminal also is said to provide program override on mode key settings. It also provides the host programmer with terminal and printer error and busy indicators, the spokesman noted.

The optional RS-232 buffered printer port for the Fox-1100 costs an additional \$86, as does the 1200's polling select option, he said.

The optional line drawing capability for the Owl-1200 editing CRT terminal is priced at \$85, he added.

The 1100 and 1200 CRTs — the first from Perkin-Elmer — cost \$1,165 and \$1,795 respectively, in quantities of five or less, the spokesman said from the company's Terminal Division at Route 10 and Emery Ave., Randolph, N.J. 07801.

Terminal Displays 1K by 1K Bits

IRVINE, Calif. — Genisco Computers has introduced the GCT-1024 digital raster graphics display system, a reportedly high-resolution graphics CRT terminal.

The system is capable of displaying 1K by 1K bits of information on the screen and is compatible with all Data General Nova, Digital Equipment Corp. PDP-11 and other minicomputers, according to a Genisco spokesman.

Has Discrete Microprocessor

The GCT-1024 includes a discrete microprocessor developed by Genisco that is said to provide instruction times of 150 nsec and 51 mnemonic instructions for increased user programming flexibility.

The basic raster display configuration includes a controller, CRT, software and the proprietary microprocessor, the spokesman said.

Keyboard Permits Programming

Options for the system include a tablemount joystick assembly, graphic tablets and cursors and a keyboard with up to 64 function keys, which permits user programmability of the system, he said.

Units with up to 16 gray scales are optionally available, he added.

The GCT-1024 is suited for command and control process simulation applications and others such as computer-aided design, weather mapping and crystallography, according to Genisco.

The basic configuration with a Nova interface is priced at \$21,500. Genisco Computers is at 17805-D Sky Park Circle Drive, Irvine, Calif. 92714.

Reality Dealers.

Anchorage 907/276-2431
Atlanta 404/266-8900
Baltimore 301/796-4320
Boston 617/890-1400
Cedar Rapids 319/377-6259
Chicago 312/298-3840
Cincinnati 513/671-1888
Cleveland 216/621-1888
Dallas 214/358-2468
Denver 303/773-1510
Detroit 313/478-4400
Harrisburg 717/763-0850
Houston 713/440-6111
Juneau 907/586-2524
Kansas City 913/321-7902
Los Angeles 213/685-8910
or 714/521-4041
Memphis 901/274-5960
Miami 305/565-0517
or 305/940-9994
Minneapolis 612/835-1000
Newark 201/964-6700
New York 212/697-4466
Philadelphia 609/779-1901
or 215/922-6776
Phoenix 602/275-7511
Portland 503/245-6631
Raleigh 919/782-6020
Richmond 804/780-2938
San Diego 714/560-0777
San Francisco 415/547-6565
Seattle 206/641-4990
St. Louis 314/946-6757
Utica/Syracuse 315/797-8062
Washington, D.C. 703/549-4300
Australia 922-3300
England 0442-61266
France 460-33-00
Germany 69-30-01
Mexico 905-536-90-50
Montreal (See your directory)
Puerto Rico 809/844-3020
South Africa 48-0520
Toronto (See your directory)
Venezuela 45.70.15



Call (800) 227-1102* for the lowest prices and fastest deliveries on new and used terminals.

*In California call (415) 632-2856

New terminals at big savings.

The lowest prices on high quality terminals going. For sale, lease or rent. TI 745 portable terminal, plus TI 735, 725, 743 KSR, 733 KSR and ASR as well. DECwriter II printer. ADDS 580 and 980 CRT's. Diablo 1620. And others.

Used terminals save you more.

These terminals have come off lease. They're in excellent shape, were regularly serviced, and have a 30-day parts/labor warranty.

	Purchase	Monthly Rental
Datapoint 2200-126 (16K)	\$5,995.00	\$325.00
Datapoint 2200-400 Com Box	550.00	32.00
TI 725 Terminal	895.00	79.95
Diablo Hytype I	1,750.00	115.00
Techtran 4100 Datacassette	600.00	49.95
Beehive IIIAE	999.00	99.00

Call from 8AM to 8PM EST.

NTC National Terminal Corporation

Oakland Airport Office Center
303 Hegenberger Road, Suite 203
P.O. Box 6579
Oakland, CA 94621, (415) 632-2856



NEW
DIABLO 1620
\$2,850



NEW
DECWRITER II
\$1,550



NEW
TI 743 KSR
\$1,195
TI 733 KSR
\$1,490
TI 745
\$1,875

NEW
LEAR SIEGLER
ADM-3
\$975



The Four-Phase OEM Business Plan

Clustered Display Systems, ANSI COBOL, and a Marketing Partner Nationwide.

The OEM Question. You've got a great program for wholesale distribution, patient care, inventory control, truck routing or some other display-oriented application. You've decided to market it as a turnkey package. Whose hardware do you choose?

General Answers. As you'll be selling into business/commercial markets, you'll need an OEM partner with ANSI COBOL and system software designed for the business/commercial user. And, to help turn potential customers into actual customers, you'll need an advanced hardware package...display-oriented, transaction-based and designed for cluster configuration. Finally, unless you're handy with a soldering iron, you want an OEM supplier with a nationwide field engineering force to install the systems you sell, as well as to provide local maintenance support to your customers.

Specific Answers. Four-Phase Systems is one of the pioneers (and largest suppliers) of display-oriented transaction processing systems for business and commercial applications. Our unique window into memory architecture puts new data on the screen instantly



with no I/O overhead. And we've installed over 30,000 video displays on our systems. Three hundred field engineers support these installations from more than 100 Four-Phase maintenance offices nationwide.

The OEM Partnership. We view an OEM relationship as more of a partnership than a buyer/vendor arrangement. You agree to make our hardware a part of your system. We agree to lease you a development system on favorable terms...and provide customer demonstration time on our branch office systems in 30 cities...plus supply all our system software at no charge.

If you've explored OEM relationships with other hardware vendors, the foregoing

has to sound like a candidate's pre-election speech. But at Four-Phase, we really do commit substantial resources to helping our OEM partners achieve increased sales. Why? Because the more our OEM partners sell, the more we sell. It's as simple as that.

All The Answers. Write, phone or return the coupon for your copy of the Four-Phase OEM Business Plan. We'll mail a copy posthaste and contact you from the nearest Four-Phase sales office in a few days.

Four-Phase Systems

OEM Marketing
19333 Vallco Parkway
Cupertino, CA 95014
408-255-0900



Gentlemen:
Our clustered display system application is _____

Please mail a copy of the Four-Phase OEM Business Plan and have your local sales office contact me.

Name _____

Title _____

Company _____

Phone _____

Address _____

Zip _____

Four-Phase Systems®



Due to Increased Business

Trucker Opts for Net to Cope With Billing Paperwork

SAN FRANCISCO — The 70th largest motor carrier in the U.S. faces many of the same problems as the nation's largest haulers: mountains of paperwork requiring a large clerical work force and stringent Interstate Commerce Commission (ICC) regulations.

The Delta Lines subsidiary of Delta California Industries opted for an intelligent terminal network to cope with increasing business and the corresponding billing paperwork.

While Delta Lines — including its division, California Motor Express — ranks 70th in terms of revenues, it ranks 15th in terms of volume carried and first in terms of intra-California traffic.

Although the length of a larger interstate carrier's haul may average 1,500 miles, Delta's average length is closer to 180 miles; and while an average freight bill at a larger, long-haul carrier could be \$75 to \$80, Delta's is less than \$30.

The job of getting a freight bill to the correct terminal location on time, however, is just as costly and equally important.

Although some larger carriers can afford an on-line computer system to keep track of their equipment on the road and transmit and store freight bills, Delta cannot afford the slow on-line editing and expense of such a system.

"We knew that we had to change from our Teletype system which had served us well when we were doing 4,000 to 5,000 freight bills a day — but at 14,000 daily, we needed a more effective and yet economical communications system, as well as one that would help minimize clerical billing errors caused by the pressure of preparing such a volume of documents within a very short time frame," according to Richard J.

Frazer, secretary/treasurer of Delta California Industries and responsible for its computer operations.

The firm previously used nine-part freight billing forms, "copies of which had to be manually filed at the departure and destination sites, as well as at headquarters for accounts receivable.

"In addition, an audit copy (from which

bills within seven days — which puts further demands on costly clerical staff.

"Our average length of haul is so short and more than 70% of our shipments handled are delivered on an overnight basis. We need to get the freight bill out to the appropriate terminal location the same night following pickup of the merchandise and no later than arrival of the freight at its

and began opening the doors of the trailers that had arrived throughout the night," he explained.

First Upgrade Failed

"In early 1973, we began looking at the alternatives," Frazer, who was formerly the company's DP manager, said.

"We looked at everything from on-line systems to mini-switching systems with no editing capabilities to systems that could produce and transmit freight bills while providing magnetic tape for accounts receivable applications.

"Our first system used Memorex terminal devices, which were extremely well accepted by our people; it was intended to interface with a minicomputer for message switching.

"But, due to various problems, primarily

(Continued on Page 34)

Terminal Transactions

information was used for a batch card system) then became our permanent hard copy and was filed by freight bill number," Frazer recalled.

In addition, ICC regulations require general commodities carriers to collect their

destination or prior to arrival to allow the terminal manager to better plan the next day," he said.

"Many of our operating people had no idea how much volume to plan for until they actually arrived at work each morning

Foxboro Unveils 'Advanced' CRT Display Station

FOXBORO, Mass. — The Foxboro Co. has what it called "an advanced CRT operator display" terminal for use with its Spec 200 electronic process control system.

The Videospec display station provides access to all control-room operator functions such as set-point adjustment, valve handling, alarm limits and related process parameters, according to the firm.

The station connects to Spec 200 rack-mounted control electronics through the Interspec analog/digital communications link; operator interface with processes is accomplished through a variable function keyboard.

Unmarked keys are assigned various functions according to labels on CRT screens above the keyboard.

The CRT station is said to replace control-room devices such as push buttons, switches and other panel accessories. The terminal can handle about 200 different control loops, but as many as 12 process readouts can be displayed, depending on the amount of automatic programming built into the system, he said.

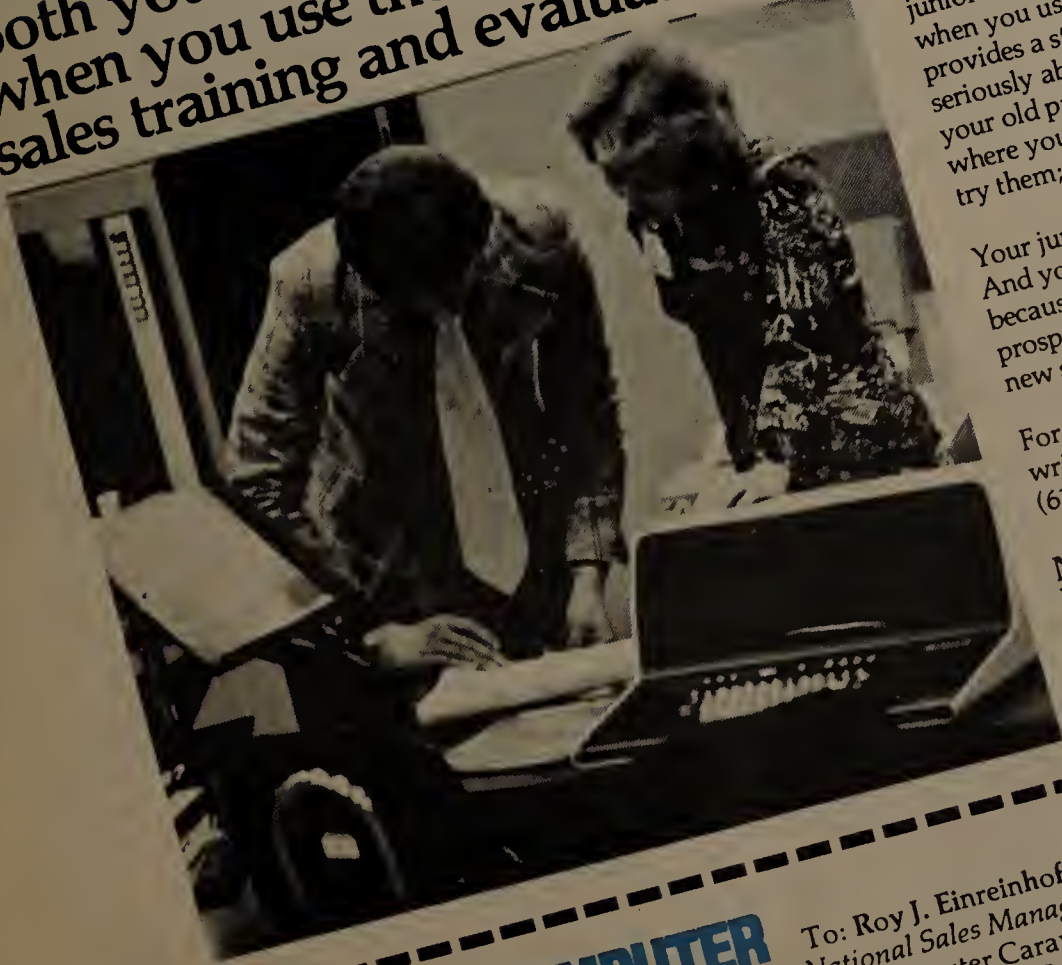
The display is programmed from microprocessors to handle a hierarchical sequence of display in quarter- and half-screen areas.

Other Videospec subsystem units — such as trend recorders and video copiers — can be optionally utilized in conjunction with the CRT station, which costs about \$27,000, the spokesman noted from Foxboro, Mass. 02035.



Videospec Display Console

Another good reason for taking part in the 1977 Computer Caravan:
Both you and your salesmen benefit when you use the Caravan for sales training and evaluation.



Your new salesmen become veterans fast at the Computer Caravan. Your junior sales staff will quickly gain a great deal of knowledge and experience when you use the Caravan as a sales training tool, because the Caravan provides a steady flow of qualified computer buyers who want to talk seriously about your products or services. Let your new salesmen learn how your old pros handle different types of prospects. It's a real selling situation where you can demonstrate appropriate sales and service methods; try them; then review them and apply them again.

Your junior staff will have the advantage of learning from real situations. And you'll be learning a great deal about your new staff members as well, because you can observe, in a controlled way, how they meet and qualify prospects. You'll benefit from the increased confidence and ability of your new salesmen all year long: in increased sales!

For complete information on how the Caravan can work for you, write us. Just use the coupon, or call Roy Einreinhofer at (617) 965-5800.

NINE COMPUTER SHOPPING CENTERS THAT BRING THE BUYERS TO YOU
March 29 - June 9, 1977 • San Francisco • Los Angeles • Cleveland
Minneapolis/St. Paul • Chicago • New York • Philadelphia
Washington, D.C. • Boston

☐ Please send me more information on exhibiting in the 1977 Computer Caravan.

Name _____
Title _____
Company _____
Address _____ State _____ Zip _____
City _____
Phone (____) _____

**COMPUTER
CARAVAN
77**
Sponsored by COMPUTERWORLD

To: Roy J. Einreinhofer
National Sales Manager
The Computer Caravan
797 Washington Street
Newton, MA 02160

Features Protocol Emulation

Delta Micro-Based CRT Designed For Variety of Nets

CORNWELLS HEIGHTS, Pa. — The Delta Data Systems Corp. 4050 is a stand-alone microprogrammable CRT terminal with protocol emulation designed for



Delta 4050

multidrop data communications networks utilizing Burroughs, Honeywell, Univac or other computers.

Similar in design and features to the Delta 4000 terminal, the 4050 reportedly provides the added capability of interconnecting several terminals on the same communications line to a CPU for random or sequential polling.

Display features of the terminal include a screen capacity of 80 columns by 25 lines of upper- and lower-case characters, half- or full-duplex and synchronous or asynchronous data transmission at rates up to

Trucker Chooses Net To Cope With Billing

(Continued from Page 33)

with the mini manufacturer, the project failed and we were forced to reevaluate the entire concept and this time opted for on-site editing devices," he said.

"We chose Sycor, Inc. Model 340 terminals because of their intelligent characteristics, cassette orientation and communications facilities and began installing them in our 50 locations around the state," Frazer explained.

The Model 340s now check to ensure that the biller completes the shipper's name and address; extends the weight of the shipment; times the rate; totals the number of pieces, weight and charges; verifies that all origins and destination codes are valid; checks minimum rates/weights tables and searches for the proper rates; and extends service charges for fluctuating items.

Most of these functions had been performed manually by a rate man; completed information was then retyped by a billing clerk.

The bills of lading are collected at the terminal locations from drivers who, much like postal carriers, have specified routes. A terminal operator then takes the melange of documents, which can range from 3 by 5-in. to legal size, and keys the appropriate information onto a tape cassette.

When the overall procedure is completed, the information is transmitted at 2,400 bit/sec to a Data General Corp. (DG) message switcher which sorts the data by destination and retransmits the information to the appropriate location.

The information received by the 340s at the destination location is then printed out on Sycor printers in the form of delivery copies to be signed by the consignee as proof of having received the freight.

At the end of the billing cycle, the DG switching device sorts all freight bills — by shipper and origin — and transmits a manifest to each origin and destination location.

It then produces a tape (eventually there will be an interface) for Delta California's IBM 370/135 CPU in Oakland, which produces freight bills in debtor order for billing purposes and retains the image of all unpaid bills. For permanent storage, the freight bill is microfilmed from a magnetic computer tape.

9,600 bit/sec.

It also incorporates an on-line printing feature permitting hard-copy output from the communications line without affecting operator keyboard entry to the display, according to the firm.

In addition, Delta's paging feature is said to permit the user to recover buffered information that has been rolled off the top or bottom of the screen.

A 2K buffer memory for refresh and display of screen data reduces the need for CPU support, according to a spokesman. The buffer can be expanded in 4K increments.

Additional Features

Communications features include a multiple-address feature which uses four 8-position switches to permit selective

group or individual terminal addressing, he said.

The 4050 terminals also can be daisy chained in a "power failure protect" mode

Terminal Transactions

on a common communications line, he noted.

An optional downstream loader allows the user to change the polling interface in the terminal from a peripheral storage device or from a communications line, the spokesman stated.

And an optional communications line monitoring feature permits the 4050 to be

operated in a full-duplex mode in which the traffic of all terminals in the system may be monitored for system start-up, debugging and troubleshooting, according to the firm.

For hard copy records of data transmission, an optional printer port is available, Delta said.

A polling interface is also available in the firm's user-programmable display terminal — the Delta 4550.

In addition to the polling interface, the 4550 includes 4K bytes of memory, expandable to 8K, and a debug package. The additional memory can be used for program storage for expanded refresh, according to the spokesman.

The price of a basic stand-alone 4050 without the daisy chaining feature is \$3,025.

Delta is at Woodhaven Industrial Park, Cornwells Heights, Pa. 19020.

We just hired a da

We're a small business systems company. When we choose a computer supplier, we're choosing an active partner. It has to be that way, because too much of our business depends on the support our computer supplier gives us. If he's not there when we need him, we're in trouble. That's why we fired our old computer supplier, and hired a damn good partner. GRI.

GRI gives us more than the most powerful business and accounting system on the market today, the System 99. GRI is there when we need them. 24 hours a day. Helping us develop our system. Helping us market our system. Helping us add dollars to our bottom line. To us, that's what a partnership is all about.

If you would like to work with a partner that really cares about your business, call Bob Knapp or Vince Finlay at 201-545-7700, or attach your business card to the coupon below and send it to us.

GRI means business.



GRI COMPUTER CORPORATION

Marketing Headquarters

870 Georges Road, North Brunswick, N.J. 08902
201 545-7700 Telex: 92-2523 Cable: GRICOMP

Corporate and Manufacturing Operations

320 Needham Street, Newton, MA 02164
617 969-0800 Telex: 92-2523 Cable: GRICOMP

Attach your business card here.

Terminex Broadens Hand-Held Line

NASHUA, N.H. — Terminex Corp. has expanded its line of hand-held interactive data entry terminals with four additions.

The Terminex HT/3, HT/4 and HT/8 terminals have display buffers, a 5 by 7 dot-matrix display of Ascii characters and up to 1,200 bit/sec operation, according to a Terminex spokesman.

Interactive Communications

These three terminals and the fourth, the HT/5, provide interactive asynchronous communications; they are RS-232C-compatible and have 128-character Ascii keyboards, he said.

The HT/3 displays a single line of 12 alphanumeric characters while the HT/4 has 24-character display in two lines. Both units operate at 1,200 bit/sec, have even parity, display the 64-character

Ascii set and operate in full-duplex mode, he said.

The HT/5 was designed for applications such as credit verification where only the status of certain functions need be displayed. It has an annunciator display of 12 labeled lights under microprocessor control to transmit information to the terminal operator, who communicates with a CPU through the terminal keyboard, the spokesman explained.

The HT/8 offers a display capacity of 80 alphanumeric characters and symbols and operates at 10-, 15-, 30- or 120 char./sec in full- or half-duplex modes, he said.

The HT/3 costs \$795; the HT/4 is priced at \$1,195; the HT/5 input/verification terminal costs \$495; and the HT/8 is priced at \$3,995, the spokesman added from 17 Airport Road, Nashua, N.H. 03060.

Retailer Increases Efficiency With Programmable Devices

NEW ORLEANS — Intelligent terminals have reportedly increased data entry efficiency for City Stores Co., owner and operator of 150 general merchandise stores, women's specialty shops and furniture stores in the eastern U.S.

With the installation of the Texas Instruments, Inc. (TI) Silent 700 Model 742 terminal, system efficiency has increased to such an extent that "our slowest add-punch operator can now input as much data on the one TI 742 in a day as did our fastest operator on the old system," according to a City Stores spokesman.

The programmable data terminal was selected, he said, because it incorporated the necessary features and met the criteria specified by City Stores management.

The Model 742 microprocessor-based intelligence provides the mandatory field

checks while offering the thermal printed output as the audit trail. The embedded numeric keypad made the transition from the addpunch to the 742 a smooth and easy one for the City Stores machine operators, according to the spokesman.

Old System, Old Problems

Billing information had previously been keyed on add-punch equipment which was rapidly becoming obsolete, the spokesman stated.

These electromechanical devices consisted of a full keyboard adding machine, a paper tape punch unit and a check-digit stuntbox. The latter unit was used to check customer account numbers which have a double-add-double Modulo 11 check digit.

The monthly billings were created from

Terminal Transactions

the individual sales tickets sent in from the local stores. The three fields which were keyed are customer account number, department number where sales ticket originated and the dollar total for the specific sales ticket. The only checking performed on this data were the check-digit and a batch total on the dollar amounts.

With the data entry errors, the rapidly deteriorating add-punch equipment and the extensive manual operations involved in the handling of the paper tape, City Stores initiated a search for a new system and vendor, the spokesman said.

Features which were specified included speedy entry, hardcopy audit trail, local intelligence resident at the machine site and high equipment reliability.

Because of future plans for expansion, vendor capabilities had to include nationwide service and support, have the ability to provide state-of-the-art technology in the future and offer a field-proven product for this application, he explained.

The system configuration has eight Model 742s communicating with the host computer, an NCR 251. The user-written program checks each and every data field on the sales ticket.

For example, the department numbers and dollar amount entries are checked for size, range and type.

The higher level applications programming language TI Cassette Operating Language, allowed City Stores to easily incorporate the Modulo 11 check-digit routine into the application program, the spokesman noted.

GRI Designs Adapter For Remote Printers

N. BRUNSWICK, N.J. — GRI Computer Corp. has a remote printer adapter for its System 99 which reportedly provides forms-handling capability for remote printers.

The printer communications adapter (PCA) accepts voice-grade communications between a System 99 CPU and the remote printer, according to a GRI spokesman. It can be used to connect a remote CRT terminal and a remote printer sharing one modem on a single communication line or used alone to connect the remote printer.

The PCA also allows hard-wired communications between the System 99 and peripherals at distances up to 1,500 feet, according to the firm.

Users control the remote print function by two control characters which activate and deactivate the remote printer. The PCA monitors all incoming data for these control characters and channels the information to the printer and/or the CRT terminal, the spokesman explained.

mn good partner.





You shouldn't have to apologize for your mother's behavior.

The problem with your big computer is that it was designed to work in batch. A mode of operation that has made your mother all too human.

It's the reason your mother has to be fed awkward media like punched cards. It's also why she can't accept data from its source, and has to spend time editing and verifying that data.

And it's the reason your big computer can't provide reports on demand. In formats that work better for your users than for her.

But don't throw up your hands and walk away. Instead, get your mother a little help. A computer that can take some of that load off her.

A Data General commercial ECLIPSE computer.

The commercial ECLIPSE computer is smaller than the big computers you may be used to using. But it has the things big computers have. A commercial instruction set that has an EDIT function, for example. And large memory configurations.

The ECLIPSE system also has incredibly easy-to-use interactive data entry/access software called Idea that speeds application development and use. And speeds use of business-oriented files maintained by our INFOS data management system with multi-level keyed access.

The COBOL that's available with the

commercial ECLIPSE computer is the highest level implementation of ANSI '74 COBOL standards. It's a complete language system that comes with features like an interactive debugger and an integrated SORT/MERGE. Plus the ECLIPSE system makes an IBM-compatible RPG II and real-time FORTRAN available.

Most important, the ECLIPSE computer has a communications ability that lets you interface to your big computer. For example, when talking to an IBM system the ECLIPSE can emulate 3780/2780 and HASP procedures. Or just be itself.

And wherever you put an ECLIPSE system, you can plan on it doing more than one thing at a time. Up to 16 Idea applications and remote job entry concurrently, for example. Or one Idea application using up to 16 terminals while a COBOL program processes previously entered data. Or simultaneous program development and communications.

It's all from Data General, a major computer manufacturer. Which means you get full software support, a range of system and field engineering services, financing alternatives, compatible peripherals and much more.

So write for information.

That way you'll be able to spend more time satisfying your users. And less time making apologies for your mother.



COMMERCIAL ECLIPSE COMPUTERS: BECAUSE YOUR MOTHER NEEDS A LITTLE HELP.

Data General

ECLIPSE is a registered trademark of Data General Corporation. INFOS is a trademark of Data General Corporation.
Data General, Route 9, Southboro, Mass. 01772, (617) 485-9100. Data General (Canada) Ltd., Ontario. Data General Europe, 15 Rue Le Sueur, Paris 75116, France. Data General Australia, Melbourne (03) 82-1361

For Maximum Efficiency

Shop Can Cut Costs by Redesigning Its Business Forms

By Esther Surden
Of the CW Staff

NEWTON, Mass. — Saving money is the eternal DP priority and justifying spending money to save it is the eternal DP problem.

One way for a shop to cut costs is to redesign its business forms for minimum print time and maximum efficiency, a spokesman for Standard Register Co. said here recently.

To justify spending the funds for this endeavor, the firm has come up with a way for DP managers to analyze their printing costs — print cycle analysis.

The object of print cycle analysis is to increase printer efficiency by eliminating spaces between print lines; rearranging print lines maintaining the same data; combining print lines and rearranging space; printing two documents at one time or side by side; and adding data to existing records.

Users Redesign Forms

Users can determine if a savings will be achieved by redesigning forms by finding the print cycle time for the particular printer. Print cycle time is the time required for printing and the time required for vertical movement of the form.

For example, an IBM 1403 Model 2 printer operates at 600 line/min alphanumeric which is equal to 100 msec/line. Form

BEFORE		
Printing Line Identification	Number of Vertical Spaces Between Lines	Milliseconds Each Print Cycle
1. Employee Name to X's below pay period	2	105.0
2. X's, Line 1 to X's, Line 2	1	100.0
3. X's, Line 2 to X's, Line 3	1	100.0
4. X's, Line 3 to Bank line	2	105.0
5. Bank to Fed. Taxes line	3	110.0
6. Fed. Taxes to Earnings to Date Line	3	110.0
7. Earnings to Date to Employee Name (first line) on next form	9	137.3
Total Milliseconds of Print Cycle Time		767.3

Before Print Cycle Analysis

movement of one single vertical space takes place during the last 20 msec of the 100 msec cycle, the spokesman said.

If form movement is greater than one vertical space, additional time must be added to the print cycle to determine the printing speed.

On single-speed printers, 5 msec are required for each line skipped after the first line, regardless of the length of the skip. On dual-

speed printers 5 msec are needed for each line skipped after the first line up to 8 lines. After that, 2.3 msec are required.

Times Compared

The idea is to compare the current print cycle time with the print cycle time that could be achieved if the following steps were taken:

- Top or bottom stub documents converted to side stub.
- The number of print lines

AFTER		
Printing Line Identification	Number of Vertical Spaces Between Lines	Milliseconds Each Print Cycle
1. Employee Name to Bonds Line	9	137.3
2. Bonds to Pay adv. Line	3	110.0
3. Pay Adv. to Employee Name (first line) on next form	9	137.3
Total Milliseconds of Print Cycle Time		384.6

After Redesign

reduced.

- Two or more documents printed side by side.
- Form length reduced.
- Print lines arranged vertically to take advantage of faster spacing on dual-speed printers.

To illustrate the method of print cycle analysis, Standard Register used an IBM 1403 Model 2 with dual-speed configuration printing a payroll check (13-5/8 in. by 3-1/2 in.) laid out for seven print lines.

Annual forms volume was 300,000. The total msec of print cycle time for the stub was 767.3. (See accompanying charts.)

Redesigned to be 14-7/8 by

3-1/2 in. with the number of print lines reduced to three, the print cycle time was calculated at 384.6 msec. (See chart)

The formula for converting msec to hours of print cycle time is as follows:

$$\text{Print Cycle Time} = \frac{\text{Per Document (Msec)}}{1,000 \text{ (line/sec)}} \times \frac{\text{Forms Volume}}{3,600 \text{ (sec/hour)}}$$

Using the formula, the form before redesign used 63.94 hours of annual print cycle time, while after it used 32.05 hours.

The difference is multiplied by the amount it costs to rent the printer each hour to calculate the savings.

Inforex Enters Distributed Area With System 7000

By Ronald A. Frank
Of the CW Staff

BURLINGTON, Mass. — Inforex, Inc. has moved out of the data entry area and into microprocessor-controlled distributed systems with the introduction of its System 7000.

The system includes the firm's first 16-bit machine which utilizes programmable ANS 74 Cobol. RPG-II is scheduled for addition late in 1977 with Basic early next year to give the System 7000 an ultimate complement of three higher-level languages.

In addition to multitasking which allows several terminals to access the same data base, "concurrency" on the System 7000 will allow users to run different applications such as data entry, processing, report generation and communications from different terminals at the same time, the company said.

Direct Memory Addressing

The System 7000 16-bit architecture is said to allow direct memory addressing, virtual storage and paging functions at "high internal data manipulation rates." The processor reportedly has overlapped I/O channels which allow movement of data in and out of external storage at rates "up to 312K byte/sec."

The processor has 224 instructions with an additional I/O capability of 62 addresses for multitasking performance usually associated with larger CPUs, Inforex said.

Both stand-alone and clustered configurations are included with

the 7110 master control terminal that can support up to seven local or remote CRTs. The master terminal includes 64K of semiconductor memory and can support four mass storage units and a variety of printers operating at speeds from 45 char./sec to 600 line/min.

The 7110 and the 7115 stand-alone terminal are based on a "Nova 1200-compatible microcomputer," the firm noted.

Also included in the System 7000 is the Model 7210 local or remote satellite terminal. Storage peripherals include a diskette drive, cartridge disk and either 800- or 1,600 bit/in. 9-track tape.

Both transaction and batch processing can be supported with binary synchronous transmission mode for remote terminals. Compatibility with IBM's Synchronous Data Link Control will be added to the system 7000 later, the firm said.

The system can operate with no local files, small files, or mass storage devices. Multiple file access methods range from simple sequential to indexed and direct access. Programmability can range from centrally controlled programs down to the single-terminal level, depending on the needs of the user, the firm said.

Data Entry Features

A subset of Cobol will be available for implementing data entry features without additional programming. These features include cursor control, field definitions, check digits, table look-up, error control, insert/delete and

similar functions.

Both master and remote terminals have 14 function keys which can be programmed for particular user applications, the firm said.

A four-terminal cluster with 64K of storage, 10M bytes of disk, 165

NOAA Using Supercomputer to Predict Weather, General Causes of Climate

By Edith Holmes
Of the CW Staff

PRINCETON, N.J. — Just how predictable is the weather? The complexity of this question and the number of calculations required to even approach an answer to it demand a supercomputer.

And that's what the National Oceanic and Atmospheric Administration (NOAA) has working on the problem at its Geophysical Fluid Dynamics Lab here.

For the past two years, the \$16 million Advanced Scientific Computer (ASC) has been used by the lab to conduct basic research in the degree to which the weather can be forecast and in the causes and effects of climate in general, according to James Welsh, supervisor of computer systems at the NOAA lab.

Manufactured by Texas Instruments, Inc. (TI), ASC has 1 million 32-bit words of memory and is capable of 50 million calculations per second, Welsh said.

char./sec printer and binary synchronous communications costs \$1,442/mo with maintenance. Purchase price is \$57,450.

A stand-alone system with one terminal, 500K bytes of dual-diskette storage, Cobol compiler

"With something this size, we don't write programs; we evolve them," he noted. The Fortran programs run on the ASC have been 'evolved' over 10 to 15 years.

The mainframe is definitely the key to the computer installation at the lab, he stated.

The peripherals are the ordinary tape and disk drives. Only four large-head protract disk modules, each with a capacity of 25 million words, made especially for the ASC by TI, make the general-purpose system somewhat unusual, Welsh said.

'Fastest Machine'

From Welsh's viewpoint, the ASC at NOAA's lab is the "fastest machine being used as a general-purpose computer."

None of the Cray 1's are used in this way as yet and Burroughs machines are still under development — though all these devices can accomplish more calculations in a second than can the ASC," he said.

The ASC is the lab's only computer and it supports all the

with batch capability and binary synchronous communications costs \$340/mo with maintenance or \$15,700 if purchased.

First deliveries are scheduled for the second quarter from 21 North Ave., Burlington, Mass. 01830.

research going on there. "In that sense, it is a dedicated machine," Welsh noted, but added the mainframe "runs batch over the counter and we saturate it."

The NOAA facility here has no professional programmers as such, according to Welsh. The 100 people at the lab — about half of whom are scientists, meteorologists and physicists — do their own programming.

Still in the basic research stage, it will be some time before the lab will be able to generate results that will make daily weather forecasts more reliable, if that is even possible, Welsh suggested.

Juggling so many simulated conditions of the earth's atmosphere and oceans, flow patterns, jet streams and ocean currents as it does, the weather model run on the ASC eats up computer power. "We never have enough computing power," Welsh said and, before long, he will begin looking for a replacement for the ASC.

What that big, fast, central computer will be remains a mystery — even to Welsh.

Move From IBM to Univac Saves for Texas Counties

DENISON, Texas — Near the Texas-Oklahoma border, the Grayson Governmental Data Center (GGDC) is finding that its new computer is a real "winner" in coping with a hefty workload for five local government organizations.

GGDC came into existence in 1974 as a shared governmental data center with a \$170,000 budget pro-rated between five governmental units. The Center, operated by eight employees, processes work for the cities of Sherman and Denison, the school

districts of both cities and Grayson County.

Bob Kannenberg, director of GGDC, feels the decision to move to a Univac 90/30 system from IBM equipment has resulted in substantial payoffs.

"We've been able to avoid expenditures of between \$6,000 and \$10,000 a year solely by eliminating second shift operations," he said.

"When GGDC first started operations, we used an IBM 3/10, which had been used by the City of Sherman. The City of Denison

had no computer of its own. However it was soon apparent that we couldn't achieve the throughput we needed to efficiently process the heavier workload for five organizations.

"If we continued with the IBM system we realized we would have to go to extra shifts and more personnel. Thus, we decided to shop around for equipment that would have the power and capability to process the work on a one shift basis," he said.

"One of the reasons for selecting Univac was that we liked their full

support policy which was particularly attractive to us as a governmental body with budgetary limitations."

The contract was signed in June 1975 and the system installed in December of that year. The 90/30 ordered by GGDC has a main memory of 64K bytes, three Univac 8416 disk drives, an integral card reader and printer.

"The throughput on the 90/30 is outstanding," asserts Kannenberg. "Previously it would take us as long as six hours to process a utility billing for one city. Now we

can do this work for both cities within three hours, allowing us to devote more time to processing new systems.

"Although there is no such thing as an easy conversion, our transition to the 90/30 went exceptionally well.

"By starting our planning at least three months ahead of time we were well prepared when the system arrived. As a result of considerable testing and debugging, plus the assistance supplied by Univac, we were able to move right over to the 90/30 without any parallel operations.

"We arranged with the City of Richardson, another 90/30 user, to use their equipment for a good deal of pre-installation testing of the more than 300 programs we had to convert," he said.

The heaviest user of the center is the City of Sherman, which utilizes about 48% of the computer's processing time.

Financial System

Besides utilities and taxes, one of the major applications for Sherman is a financial system involving departmental budgeting, accounting of revenues and expenditures, with daily and monthly reports.

The Sherman motor vehicles system keeps records of traffic citations. The traffic ticket is the initial source document for the system. Payments are processed, records updated and court dockets scheduled. Fifteen different monthly reports are run for the City Manager and Police Chief.

The Sherman ambulance system is involved with processing charges for ambulance service, keeping statistical records and recording payment receipts.

Also for Sherman is a gasoline reporting system for motor vehicles in the city motor pool. A monthly report is made to the state of Texas showing gasoline consumption on and off the highway. Under Texas state law, cities are entitled to a tax refund for the amount of gasoline consumed "off the highway."

Payrolls Prepared

Biweekly and semimonthly payrolls are prepared for employees of five organizations totaling about 2,000 persons. These are Grayson County, the cities of Denison and Sherman, Texoma Regional Planning Commission, involving Grayson, Fannin and Cooke counties and the North Texas Education and Training Cooperative, covering the three counties of Collin, Denton and Wise.

For Grayson County, a vehicle tax billing consisting of about 24,000 bills is processed by the 90/30. A real estate tax billing for the county, currently being performed by a service bureau, will be added to the computer's chores this year.

The Grayson County master file of 40,000 voters is maintained by the computer system. Precinct lists are prepared on the 90/30 for voting in the primary, general and local elections.

A file is kept for the Grayson County vehicle registrations. Listings are run for city police and the county sheriffs' offices. Through a special program, vehicle registration files can be accessed rapidly to check on specific vehicles.



'The DREAM Machine

CMC introduces the all new XL40 Distributed KeyProcessing™ System.

Blending Data Retrieval, Entry And Management, the XL40 combines the newest distributed processing and data entry technology with an exceptional file retrieval capability. *Distributed KeyProcessing* means data is entered, validated, and managed at the source—where it originates—by people who really know what the information represents. Distributed KeyProcessing reduces your data processing costs by detecting and correcting errors before they reach the mainframe, providing local pre-processing, and optimizing the management of your organization's data.

First in a family of CMC Distributed KeyProcessing Systems, the XL40 is available with one to seven keystations in a choice of keypunch-style keyboard or typewriter style with numeric pad, and features expandable disk capacity from 4.4 to 35.2 megabytes. Using a variety of industry-standard protocols, including HASP workstation, the XL40 communicates with your mainframe wherever it's located.

Your software dreams come true with a fully compatible subset of ANSI COBOL and XL/OS, an automatic and dynamic multi-task operating system specially designed for the XL family. XL/OS provides disk and memory allocation, ensures data and system integrity, and controls all system resources. The XL40's information retrieval package, COSAM (COBOL Shared Access Method) features indexed files which you can retrieve and update on the spot, ensuring instantaneous response at the source.

Don't just dream about it, call or write today for our brochure on the XL40 Distributed KeyProcessing System, The DREAM Machine for Data Retrieval, Entry And Management. With the XL40, just as with dreams... the possibilities are unlimited.

KeyProcessing is a trademark of



a division of Pertec Computer Corporation

12910 Culver Boulevard, P.O. Box 92300, Los Angeles, CA 90009
Telephone (213) 822-9914, TWX (910) 343-6451

In First Installation

User Cuts Time 20% With Memorex 3340-Type Disk

NEW YORK — The Advertising Checking Bureau, Inc. (ACB) said it has gotten a substantial improvement in the overall performance of its computer system since installing a Memorex 3640 disk storage subsystem.

To handle the media verification, market and statistical research projects required by its clients, the bureau had an IBM 370/115-2 processor with 420M bytes of on-line storage provided by a leased IBM 3340 storage facility.

The ACB decided to evaluate the

Honeywell Adds Features to PPS Printing System

WALTHAM, Mass. — Honeywell has introduced several enhancements for its 12,000-and 18,000 line/min Page Printing Systems (PPS).

The new features include colored toners, multicolored preprinted forms, character sets for letter-writing and simple forms-drawing functions, and enhanced software including support for printing Burroughs 6700 computer data.

All will be available in the first quarter of 1977.

"Current PPS customers can install any of the new options without causing any degradation in operation," according to Ronald F. Borelli, director of Page Printing Systems Operations.

"These customers now are producing on each system an average of 1.5 million pages per month. Some are producing up to 3 million pages per month on the faster printer and plan to add further work to the same system."

"The PPS's new versatility with color and letter-writing type-styles will permit customers to extend its use to the roughly 35% of computer printing that most companies do for distribution to customers," he claimed.

"Until now almost all applications within the non-impact printing industry have been limited to the 65% of printing usually devoted to internal documents, he added.

The color toner option is priced at \$133/mo on a five-year contract or can be purchased for \$5,600. It can be added to currently installed systems. Prices for green or blue toners vary from \$13.75 to \$16.50 per quart, depending on order quantity. Red is expected to be added in the near future.

A character-set extension for text printing provides for use of the PPS in text writing.

Memorex 3640 subsystem — a plug compatible alternative to the IBM 3340 — to determine whether the 3640 offered any measurable price/performance or reliability advantages over the installed equipment.

Following its evaluation of the two disk storage subsystems, the bureau elected to replace the IBM 3340s with purchased Memorex 3640 drives. It was the first 3640 subsystem installation.

The new configuration consists of the 370/115-2 CPU, a Memorex 3643 disk drive module/controller and two 3640 disk drive modules. Total subsystem storage capacity — 420M bytes — is the same as the previous IBM configuration.

Attachment of the 3643 was made via the Direct Disk Attachment on the 370. Conversion from the 3340s to the Memorex 3640 subsystem was "near perfect,"

ACB said.

The new installation has improved the processing speed of the CPU, according to George Sinks, director of management information systems.

This results from an advanced voice coil servo system incorporated into the 3640 drive that provides a 20 msec average seek time — 20% faster than the replaced IBM 3340s, he said.

Enhanced performance was not the only factor prompting the ACB to switch to the Memorex drives, however. "Almost all of our data processing activity is client related," explained Warren Grieb, executive vice-president of the bureau. "Thus, reliability was paramount in the final decision to purchase disk drives from an independent. Memorex has an excellent reputation for product reliability and quality," he added.

MRI and SYSTEM 2000. Your resourceful approach to Data Base Management.

Data is a resource—a resource which can provide a wealth of information for management as well as technical personnel—a resource which can aid and increase productivity throughout a company. MRI Systems Corporation is in the business of providing tools for tapping this resource through the facilities of effective data base management.

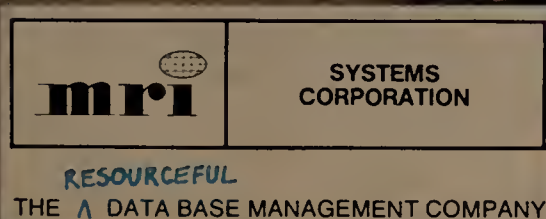
Since 1969, MRI has continued to refine a system which satisfies user requirements, increases "resourcefulness" of data, and prevents user operating costs from rising.

The result of this refinement is SYSTEM 2000, a generalized data base management system, a practical and proven capability used by hundreds of organizations which have recognized the need to get more out of their data.

MRI Systems Corporation has the specialists to help you bridge the gap from basic resources to highly refined management information. The technology is data base management and the company dedicated to serving your current and future DBMS needs is MRI. Together they make your data a more manageable and available resource.

Call your nearest MRI representative or write David Jackson at MRI corporate headquarters. Ask about SYSTEM 2000 and data base management. Ask about MRI's consulting services, educational programs, and customer support.

Take advantage of your resources... and ours.



Headquarters: 12625 Research Blvd., Austin, Texas 78759 (512) 258-5171
 Huntsville • Kansas City • Los Angeles • New York • San Francisco • St. Louis
 MRI Systems (Canada) Ltd., Toronto • CGS Products • Brussels • Düsseldorf •
 Milan • Bonn • Stockholm • Taipei • Teheran • Tokyo • London •
 Services: (BOS) Data Systems, Inc. (Grunnig) • Computer
 CYBERNET • (BOS) • Information Systems Design (ISD) •
 Systems, Inc. • Edin Computer Services • Systems Dimension
 • Texas • A&M University

Chicago • Houston •
 D.C. • International Sales
 • Zurich • SYNTAX
 • Adverg Computer
 Computer Systems Ltd.
 Inc. • ST. • Idaho • (CSC) •
 United Computer Systems

VERSATEC
A XEROX COMPANY
2805 Bowers Avenue
Santa Clara, California 95051

Just one of the many leading companies you'll see at

**COMPUTER
EXPO 77**

Versatec will show you new electrostatic printer/plotters that write and draw a square foot of data in just a few seconds. See computer generated graphics plotted on 36-inch wide paper. Watch Tektronix CRT images become hard copy within 12 seconds.

Organized by:

**COMPUTER
CARAVAN
77**

The national computer exposition that's coming to you.
797 Washington Street, Newton, MA 02160
(617) 965-5800.

San Francisco • Los Angeles • Cleveland • Minneapolis/St. Paul
Chicago • New York • Philadelphia • Washington, D.C. • Boston. Starts March 29th.

Smithfield Packing Innovates With Hams, Third-Party Service

SMITHFIELD, Va. — Many users who have installed equipment from a variety of vendors have turned to third-party maintenance firms for service on their entire systems.

But Smithfield Packing Co. here isn't a multivendor shop and its reason for going to an independent maintenance firm was simply one of cost.

Smithfield Packing, a subsidiary of Smithfield Foods and originator of the Smithfield Ham, retained Raytheon Service Co. last March for primary field maintenance of its entire system.

Saving on Maintenance

Raytheon's third-party maintenance has been "equal to or better than" that which the firm had before and at a 25% monthly saving, according to Archie F. Allen, DP

manager.

Smithfield, which does \$150 million of business annually packaging hams, bacon and sausage, also owns and operates a chain of 23 restaurants (Family Fish Houses) in Maryland, Virginia and North Carolina.

The computer system to support these activities consists entirely of IBM equipment: a 360/40 mainframe, 2401 and 2403 tape drive and control units, 2501 reader, 1442 punch, 2311 disk drives, 2821 and 2841 control units, and a 1052 console.

"This system," Allen said, "is the backbone of our operation. It is an on-line, order entry system that also performs payroll, general ledger, sales analysis and sales realization functions."

"The system is operational 19 hours a day, and thus its continued functioning is critical," Allen added.

"We have, essentially, no backup for it. When it goes down, chaos results, and we can't load trucks, make shipments — or do any business."

Breakdowns

"Before we hired Raytheon, we had a couple of breakdowns for extended periods of time. We felt that we needed more routine maintenance to avert them."

At first, Allen said he was concerned about Raytheon's ability to respond quickly should a breakdown occur.

"When the contract was signed, the nearest Raytheon field service representatives were in Washington, D.C., or Richmond, Va. — a couple of hours away. Soon, however, they opened a service office nearby, and I'm confident that should a problem arise, a Raytheon engineer will be here within an hour."

More important, according to Allen, the Smithfield system now receives the preventive maintenance it needs. "Raytheon promised us maintenance once a week, and that's what we've received."

Owens-Illinois Shows 40% Throughput Gain With Calcomp Drives

TOLEDO, Ohio — Owens-Illinois, the \$2.3-billion-a-year manufacturer of glass, plastic, paper and metal packaging, has increased throughput capacity by 40% because of a Calcomp 1035/235 disk storage facility, according to Donald R. Lee, operations manager at the DP center here.

This substantial increase in throughput capacity for the company's two IBM 370/155 computers is attributable to the unique dual access feature of the Calcomp disk system, he said.

Dual Access

This optional feature allows two controllers to access any two disk spindles through two totally different paths. Dual access thus improves throughput by balancing the work load between channels and reducing what would otherwise be wasted computer wait time.

"Before procurement of the Calcomp system (which consists of four 1035 controllers and 22 spindles of 100M-byte storage), our data load on one channel might be 80%, but on another channel, only 25%," Lee said.

CPU Wait Reduced

"With the Calcomp system and dual access, load on both channels is equalized to about 30% each, decreasing CPU wait time by about 10%."

Another advantage noted for the Calcomp 1035 is its failsafe capability. In the event of one controller's failure, a second controller is energized to support all drives, he noted.



Background photograph near Dornie, Scotland

U.S. Patent No. 3,692,255. Born in the clan.

Scotch® brand data cartridges are the best choice for your cartridge system for a number of reasons. Because we invented both the cartridge and the drive back in 1971. Because we make more of these data cartridges than anyone else in the world. And because our Scotch brand label is backed by the most experienced producers of magnetic recording media. A dedicated team of research experts, production specialists and sales and service technicians. The 3M Clan.

Scotch data cartridges are available worldwide from 3M and from leading data products suppliers who've joined our clan.

Whatever brand of cartridge system you're using, Hewlett-Packard, IBM, Tektronix or others, Scotch data cartridges are compatible.

For more information, write: Data Recording Products Division, 3M Company, P.O. Box 33255, St. Paul, Minnesota 55133.



Count on the clan.

3M
COMPANY

Mini Bits

On-Line Dispatch System

'Safer' Helps Blaze Paths to Flames

By Esther Surden
Of the CW Staff

SAN FRANCISCO — The fire department here has implemented a minicomputer-controlled central dispatching system linking 45 fire stations and designed to get fire-fighting equipment to its destination as efficiently as possible, according to battalion chief Robert E. Rose. The system, which has been operational since the first week in November, runs 24 hours a day, seven days a week under the control of two Digital Equipment Corp. PDP-11/40 systems.

The project to develop the system, dubbed "Safer" for System for Assignment of Fire Equipment and Resources, was funded by a \$1.8 million bond issue passed in 1971.

A project team was formed to supervise the design phase. During this phase, Systems Science Development Corp., a subsidiary of PRC Public Management Service, "turned out the hardware and software specifications for the system," Rose said.

The firm competed with other contractors for the bid to do the actual system implementation and installation and was se-

lected after "a lot of investigating."

Prior to the installation of Safer, every alarm that came into the fire department sounded in every station. The station watchman referred to an assignment card and compared this against a status board.

The watchman then decided which particular station was to dispatch equipment to the fire.

This method required that the status of all the fires in the area be kept at every station. With 45 stations and a rotating schedule of watchmen, "errors could creep into the system," Rose said.

In addition, the alarm was sounded via ringing bells, and studies had shown that "the shocking of the system at night was a direct factor in the high incidence of heart attack with firemen," he said.

Quick Dispatch

With the minicomputer-controlled system, a person reporting a fire calls in and gives its location and nature. The call is answered by a dispatcher wearing a headset to allow for hands-free operation.

While the caller is still on the phone, the dispatcher uses a CRT console to get the

fire-fighting equipment moving.

The caller tells the dispatcher certain characteristics of the fire, such as if it is a building fire or a single-unit fire, and the operator codes in the response. The system responds with a suggested dispatch, which the user can override if necessary.

"Hopefully, since the system has been programmed to our needs, the user will simply verify the response that appears on the CRT. The operator will then press one button to activate the line or lines to the firehouses that will be involved in the fire. The information is transmitted to a Teletype at the firehouse and a tone alert is sounded to arouse the firemen. The power that is required is also activated," Rose noted.

The system stands by for an acknowledgment from the firehouse that the alarm has been received. This is sent by the watchman.

To assure the system is always working, the minicomputers poll every station every 15 seconds and get an answer back.

Hardware for the system includes the two minicomputers, three disk drives and two tape drives. "The information is written in two places at the same time so if we have one disk failure we can fall back on the other one," Rose said.

"We have three two-position consoles on the main floor as well as another console located in a separate room and used to monitor the status of the lines going to the fire stations. This can be used as backup," he explained.

Each of the consoles, which are specially designed, incorporates a TEC, Inc. 400 series CRT with a console keyboard that has a key for every unit in the service and alpha symbols for keying in such information as the street address.

Four of the stations are staffed round the clock with the rest of the stations available for backup, training and supervision. Communications to the fire stations takes place via twisted-pair lines "put in throughout the system some time ago," Rose noted. The fire stations have Teletype 28 KSR.

The use of a turnkey minicomputer system has given the department greater accuracy by giving the users greater control over the response, Rose said.

"In the past, it took about five people to handle a single incident: with the new system, one person can conceivably handle an entire incident through the receipt of an alarm to its dispatch and sending of information out to a station. The system eliminates all the manual looking up we had to do before," he explained.

"If we received a telephone call, we had to go to a manual file, check the location, availability of the unit, use the telephone dispatch or perhaps the bell depending upon the kind of alarm," which are all time-consuming steps.

'Mini' Appoints Sanford To Executive Post

ROLLING MEADOWS, Ill. — Donn W. Sanford has been appointed executive director of the Minicomputer Industry National Interchange (Mini), which has established executive offices at 4902 Tollview Drive, Rolling Meadows, Ill. 60008.

According to Jon David, Mini president, the organization has an international membership base and is dedicated to those using or having an interest in mini and microcomputers.

Sanford, a Certified Association Executive, was formerly executive director of the Data Processing Management Association.

Three-Day Seminars for Cities

NEW YORK — A three-day seminar to examine the uses, economics, programming and implementation of minicomputers will be held in Chicago, Los Angeles and Toronto in February, April and June respectively.

The seminar costs \$395 per person plus a \$50 registration fee for each organization represented. Information is available from Heidi Kaplan, Information Systems Seminars, New York Management Center, 360 Lexington Ave., New York, N.Y. 10017.

Fundamentals Course Offered

MAYNARD, Mass. — Digital Equipment Corp. has a mixed-media audiovisual course on minicomputer basics designed to "present computer fundamentals" to management and technical personnel without DP knowledge, the firm said.

Called "Introduction to Minicomputers," the course works with a La Belle Courier-16T playback unit and includes a set of programs, workbooks, guides and tests.

It costs \$1,950 for the materials or \$2,449 for the materials and a playback unit, DEC said from Maynard, Mass. 01754.

Forms Decollated by Hand

BOSTON — Two products from Data Forms Co., Inc. called Webvelopes and Webletters for continuous processing can be decollated by hand, the firm said.

Designed for minicomputer and word-processing users, the forms can be "decollated in seconds," the company claimed.

Prices range from \$80 for 1,000 to \$20 per 1,000 for 25,000. The company can be reached at Box 381, Kenmore Station, Boston, Mass. 02215.

EAI Parallel-Processing Family Interfaces to Digital Systems

W. LONG BRANCH, N.J. — Electronic Associates, Inc. (EAI) has introduced a family of small-scale analog parallel-processing systems said to easily interface to digital systems.

Digital connection is accomplished through the EAI 2000's built-in, industry-standard RS-232 or CCITT serial communications port, a spokesman said.

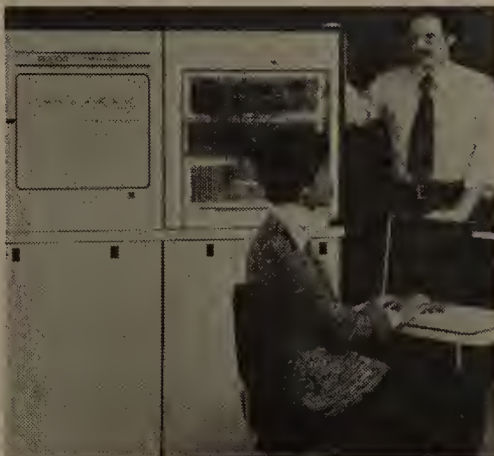
An optional parallel interface is used for high-speed bidirectional data flow.

The systems can also be used as stand-alone analog processors, EAI stated, with I/O conducted through a CRT console. The monitoring and control station "lets users access the parallel processor in the same manner as a digital computer would be accessed," via a keyboard program management feature, according to the company.

Software for the system includes a communications library of 60 Fortran-based routines used with the serial port for automatic program preparation and operation of the system's parallel mathematical blocks.

The parallel data communications port has a library of 25 Fortran-based programs associated with it, the spokesman added.

For users with large simulation problems, the firm offers a Fortran-based compiler called ECSSL which accepts differential



EAI 2000

equations and outputs a parallel-processor program.

Designed for users in scientific, educational, aerospace and transportation fields, the systems can be used for simulation, system analysis and design, production testing and laboratory monitoring and control.

A basic EAI system including a CPU, user terminal and a basic set of parallel-processing modules costs \$15,000. Prices range upward depending on the modules included, the spokesman noted from 185 Monmouth Park Highway, West Long Branch, N.J. 07764.

300LPM Line Printers — \$2,000. OFF!

- 1 Digital Equipment Corporation's 300LPM line printer costs more than \$11,500, and is usually delivered in 120 days or more.
- 2 Digital Associates Corporation sells the SAME 300LPM line printer for \$9,500, and gives you delivery in 30 days or less. You also get the full printer system, with controller and installation anywhere in The United States, and it's compatible with DEC, Data General, DCC, HP, Interdata and other mini-computers.
- 3 It's this simple! You save \$2,000, and at least 90 days in delivery time. If you don't believe it, call or write us today!

Call Today:

1039 East Main Street, Stamford, Ct 06902
East, (203)327-9210, Midwest, (612)890-8988
West Coast, (714) 549-8555



Digital Associates Corporation

The largest selection of 100-1000LPM line printers in the world.

AMDAHL-470/V6 370/168 370/158 FINANCIAL LEASES

24 to 48 month "walkaway" leases
on IBM 370/138 and 370/148 systems.

National Computer Rental, Ltd.

415 Madison Avenue
New York, New York 10017

Tel. No. (212)532-1500

Member of Tiger Leasing Group
Member Computer Lessors Assoc.

11 ways Wiley gets into your system...



THE COMPLEXITY OF COMPUTING

John E. Savage

A new and highly productive approach to the solution of complex computer tasks. This book investigates the interaction of programs and machine from an efficiency point of view, specifically in terms of space-time tradeoffs. Providing the theoretical tools to determine the complexity of a problem in advance of actual programming, the techniques described prove highly useful in achieving the most efficient cost-effective use of computers.

(0 471 75517-6) 1976 391 pp. \$22.95

MICROPROCESSORS Technology, Architecture, and Applications

Daniel R. McGlynn

Showing how a microcomputer system is built and used, this reference also provides a unique survey of the specific models of microprocessors available today. Gives useful, actual applications including automotive, telecommunication (satellite systems), and a low-cost home computer. For workers in or students of electronics, engineering, and computer industries.

(0 471 58414-2) 1976 207 pp. \$11.95

THE DATABASE ADMINISTRATOR

John K. Lyon

A lucid exploration of the world of the database administrator—the individual who manages the data resources of an enterprise. Lyon looks at the role of the DBA, its relationship with other resource managers, and the myriad responsibilities dealt with in the course of a day. The DBA's role in design, creation, maintenance, restart/recovery, security, quality assurance, and auditing are pursued individually and illustrated with examples.

A volume in Business Data Processing:
A Wiley-Interscience Series, edited by
Richard G. Canning & J. Daniel Couger.

(0 471 55741-2) 1976 170 pp. \$14.95

SOFTWARE RELIABILITY Principles and Practices

Glenford J. Meyers

Covers all known state-of-the-art solutions to what is probably the most pressing problem in data processing, the unreliability of computer programs. The proposed solutions cover all aspects of software development, beginning with the establishment of initial requirements and objectives and ending with acceptance testing. It also discusses the closely related considerations of documentation, project management, and programming tools, and considers the new programming technologies. For anyone in need of insight into the unreliability of software.

A volume in Business Data Processing:
A Wiley-Interscience Series, edited by
Richard G. Canning & J. Daniel Couger.

(0 471 62765-8) 1976 360 pp. \$19.95

MICROPROCESSORS AND MICROCOMPUTERS

Branko Souček

Here's a description of the application, programming, and interfacing techniques common to all microprocessors. It concentrates on detailed descriptions of representative microprocessor families and includes explanations of digital codes, logical systems, and microcomputer organization. It also presents the basics for design and use of microprocessor-oriented systems and coverage of new microprocessors and special purpose microsystems.

(0 471 81391-5) 1976 607 pp. \$23.00

QUEUEING SYSTEMS Vol. 2: Computer Applications

Leonard Kleinrock

This volume explores bounds, inequalities, and approximation to capture the essential behavior patterns of queueing systems, including transient and nonstationary behavior. It establishes a basis for time-sharing studies by developing the basic notions of priority queueing systems. Readers find extensive treatment of multiple-resource models as they touch on numerous fields and open up many important, largely unexplored problems.

(0 471 49111-X) 1976 549 pp. \$24.95

DATA PROCESSING IN 1980-1985 A Study of Potential Limitations to Progress

T. A. Dolotta, M. I. Bernstein,
R. S. Dickson, Jr., N. A. France,
B. A. Rosenblatt, D. M. Smith, & T. B. Steel, Jr.

This SHARE, Inc. study forecasts the problems the data processing industry will face in the near future. It examines in detail the changing requirements that will be forced on the industry as the percentage of the labor force dependent upon data processing grows from 30% today to 70% in 1985. Important reading for all managers and professionals in the field.

(0 471 21783-2) 1976 191 pp. \$13.50 (cloth)
(0 471 21786-7) \$ 6.95 (paper)

WILEY-INTERSCIENCE, a division of John Wiley & Sons, Inc.
605 Third Avenue, New York, N.Y. 10016
In Canada: 22 Worcester Road, Rexdale, Ontario

- Please send the books indicated for
10-DAY FREE EXAMINATION.
(Restricted to the continental U.S. and
Canada.)
- ☐ Savage (0 471 75517-6)
 - ☐ McGlynn (0 471 58414-2)
 - ☐ Lyon (0 471 55741-2)
 - ☐ Meyers (0 471 62765-8)
 - ☐ Souček (0 471 81391-5)
 - ☐ Kleinrock (0 471 49111-X)
 - ☐ Dolotta (0 471 21783-2) cloth
(0 471 21786-7) paper
 - ☐ Boar (0 471 08413-1)
 - ☐ Cohn (0 471 16436-4)
 - ☐ Wesolowsky (0 471 93373-2)
 - ☐ Enter my subscription to SOFTWARE.

Small Business System Helps Dealers Control Thousands of Inventory Items

Inventory control is a common problem shared by parts dealers everywhere, but two such dealers — Weber's White Truck of Washington, D.C., and Autoparts, Inc. of Providence, R.I. — have solved their inventory problems using a small business system.

Autoparts, a \$2 million company with 35 employees, presently handles 22,000 items in its inventory.

"In a business like ours we have an extremely complex costing system with a very complicated pricing structure," according to Wilfrid A. Niquette, controller. "Our costing system is based on a percentage of jobber price.

"Upon the change of either this percentage or the jobber price, our employees, under the old system, would go through the files and manually erase the old price on each card and put in the new one," he explained.

In one case, this meant over 2,300 cards had to be revised either in our spare time or on overtime. Now, our small business system does it quickly.

"Moreover, our office staff has been reduced by 50%," he stated.

Investment Reduction

The company previously used a combination of manual accounting and a service bureau for accounts receivable. The inventory

and sales information currently on the system has resulted in a better product mix and an 18% reduction of inventory investment, according to Niquette.

"Our original savings for tangible cost projects was estimated at \$300 monthly, but there are also a number of intangible savings that result from increased employee accuracy and a better use of time," he said.

"For instance, we produce a variety of inventory and customer sales analysis reports. If we were to try to duplicate those using a clerical staff, it would require many additional employees or such reports would be unobtainable under the old system," he explained.

The business system at Autoparts includes a Basic/Four 32K CPU, two disk drives, three CRTs and one medium-speed matrix terminal.

Customized Inventory Control

Weber's White Truck found it could customize its inventory control system by using a preplanned software application package designed for general accounting functions common to a variety of industries, according to Ray Ashman, business manager.

With 28 employees at its Washington, D.C., location, Weber's did over \$4.5 million worth of business last year and has an inventory of some 6,500 parts for trucks and engines.

Using the manual system, the counter clerk would scan a microfilm file to find the part number and then go to a large Wheelindex to find the location of the part in the stockroom, Ashman explained.

Then after finding the part — if it was there — he would bring it back, go to a large card file, find the part's inventory number and reduce the inventory.

Finally, he would have to go through an elaborate set of price books, find the price, and return to the counter to fill out the order form, he said.

Now, with a CRT on the stockroom counter, the clerk can ask the system for information and after getting the part number from the microfilm, he can type the number on the terminal, according to Ashman.

The screen indicates the part's location, its cost and the correct inventory count. A second CRT in the bookkeeper's office handles the accounts receivable.

Data Cartridge Drive Now Offered From 3M

ST. PAUL, Minn. — An OEM drive mechanism for the 3M Co. DC100A data cartridge is available from that company.

The unit, designed for incorporation in small systems, uses TTL logic and includes an electronic interface contained on two printed circuit boards, it noted.

Recording is accomplished serially across the tape width and encoding is independent of tape speed, the company stated.

The drive costs \$400 in OEM quantities. Information is available from Dept. 125A, 3M Co., Box 33600, St. Paul, Minn. 55133.

Mail to: WILEY-INTERSCIENCE
P.O. Box 092, Somerset, N.J. 08873

☐ Payment enclosed, plus sales tax. Wiley pays postage/handling. We normally ship within 10 days. If shipment cannot be made within 90 days, payment will be refunded.

☐ Bill me. ☐ Bill firm or institution.

NAME _____

AFFILIATION _____

ADDRESS _____

CITY _____ STATE/ZIP _____

Prices subject to change without notice. 092 A 2320-57

Calls Move 'Expedient'

Firm Combines Word, Data Processing

NEW YORK — The first user of IBM's Word Processor 32 system has called the move to the combined DP and word processing system "expedient."

Business Equipment, Inc., which previously used a service bureau for its DP functions and in-house IBM Mageard IIs for word processing, saw the need to find a better route. The Mageard IIs were getting bogged down, according to Stephen F. Schmelzer Jr., treasurer and chief of operations.

"We probably would not have moved from the service bureau for the DP if a combined system was not available."

"We'll use the Word Processor 32 for direct mailings to more than 1,000 customers on our mailing list," Schmelzer said. "These letters announcing new products and services represent the traditional word processing function — volume document preparation."

Schmelzer selected the system over competing available equipment for two reasons. He liked IBM's 24 hr/day service policy and he thought he could easily find trained operators for the system.

Programming is being done on the outside, he noted.

"The real reason we went to the combined system, however, is not volume, but accuracy. In our business, accuracy equates to success," according to Schmelzer.

If a customer wants 100 blue fabric swivel chairs and your order comes in 100 black vinyl stacking chairs, you've just bought your own mistakes.

"The transposition of a couple of digits on a part number can be costly. There are many variables in each order — as many as a dozen for a single chair — and we can't afford to make mistakes, he stated.

By using the system to assist in letter quotes and purchase documents, "we think we can improve accuracy, build profit and assure customer satisfaction," he contended.

In furnishing a multistory office building or assisting with a move of a corporate headquarters, Business Equipment served as a contractor or consultant, Schmelzer explained. Sales personnel work closely with an architect or specifier.

Working within customer budget requirements, the specifier is introduced to the large number of manufacturers who might supply the furnishings. Once a manufacturer is selected for each item, further details, such as color finish, style and price are determined, he said.

Between the initial document and the final letter quotation on which the customer signs off, there may be five or six major revisions.

The System 32 simplifies these revisions and assures accuracy by recording the information once

for reuse in revised documents, according to Schmelzer.

Eventually the 32 will sort orders by manufacturer and allow for automatic generation of purchase orders, updates of delivery schedules, pricing information and so forth, he predicted.

"The 'global change' feature (replace a word or phrase throughout an entire document) will be helpful for us when a manufacturer discontinues a certain item, fabric or finish,"

Schmelzer said.

"The advantage of having all of our traditional DP functions, such as payroll, accounts payable, etc., in-house will be a real plus.

"The cost of the entire system is comparable to what we were paying to have only our accounting functions done by an outside organization.

"Now we will have word processing features, accounting functions and control of the reports we need," he added.

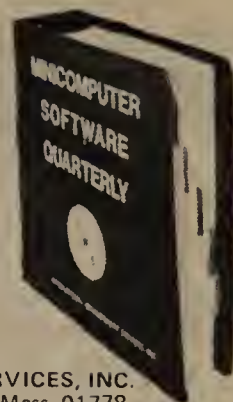
LOCATE and EVALUATE MINICOMPUTER SOFTWARE

- Over 300 completely detailed program descriptions.
- Operational requirements
- Indexed by Application
- Cross referenced by:
Minicomputer CPU (S)
Source Language

Subscription Includes: Base Volume
plus 4 Updates

\$75. U.S./Canada - \$100. Foreign

INTERNATIONAL MANAGEMENT SERVICES, INC.
70 Boston Post Road, Dept. C - Wayland, Mass. 01778



Very little stands between your mini and the disk drives of your choice.

Just Telefile's little Matchmaker disk controller. With it, we can put your minicomputer together with any of the latest 3330-type disk drives: Ampex, Memorex, CalComp, Control Data, or Diablo. You'll have a system no one else can match.

Greater flexibility.

Special tailor-made, compatible interface modules make changing minicomputers a snap.

To change drives, simply switch circuit boards. Capacity can grow from 13.3 million to 1.2 billion bytes per system.

Interface software included.

Telefile even provides handlers

that make the Matchmaker software transparent to the operating systems of most major minicomputers.

Unmatched features.

Telefile's Matchmaker controller brings to minicomputer users the latest large mainframe disk technology with such features as: *Search and read command* to help you with data base management. *Write protection* to the sector level. And *Advanced error recovery* techniques.

The Matchmaker even comes with a separate maintenance module for offline disk pack formatting and test exercising.

And Telefile stands behind the

system not only with hardware and software, but with nationwide service support in major metropolitan areas.

Write for our authoritative book.

100 fact-filled pages on the universal Matchmaker concept including operation, functional specs, features, diagnostics, installation, and maintenance. Get it free by writing: Telefile Computer Products, Inc., 17131 Daimler St., Irvine, CA 92714. Or call toll-free (800) 854-3128. In Calif., (714) 557-6660.

Telefile

Enhancing computers is our business.

HP Cuts Printer Cost

PALO ALTO, Calif. — Hewlett-Packard Co. (HP) has reduced prices by 7% on its line printer subsystems purchased as part of HP 3000 systems.

Prices for the line printer subsystems range from \$9,400 to \$37,125. HP is at 1501 Page Mill Road, Palo Alto, Calif. 94304.

WANT TO MAKE YOUR RSTS APPLICATIONS LOOK LIKE A MILLION DOLLARS???

You can for as little as \$3000!

Just call Montreal (514) 933-4474 and enquire about the MISAM-II package. The powerful multi-index-sequential-access-method. Ask us also about RPL11, the 'easy to use' Report Programming Language. Or write:

Info Boutique Ltd., 3470 Simpson St. Suite 810, Montreal, Quebec H3G 2J5.

Plastics Firm Converts to Small System For Upward Growth Compatibility

By Esther Surden
Of the CW Staff

MOUNTAINSIDE, N.J. — Upward compatibility and a growth path that doesn't mean changing CPUs each time the company expands were the reasons for Precision Polymers, Inc.'s decision to replace its IBM 3 with another vendor's small system.

"We weren't satisfied with the 3/10's capacity for upward

growth, especially in communications and software," according to Robert S. Williams, director of management information systems.

The plastics manufacturer looked at a Burroughs system, an IBM 3/12 and the Honeywell 62/40 Liberator and "chose the Honeywell based on the capacity to add more core, the internal processor speed, the ability to add more drives and a faster printer without having to change hard-

ware, Williams said.

"If we went to the 3/12, we'd have had to move all the old equipment out and the new in and do the same thing the next time we upgraded," Williams said.

With the Honeywell system, the firm has a growth path for at least the next three years, he added.

The changeover also resulted in a \$500/mo reduction in rental cost for the firm, Williams noted.

The 62/40 has 112K of memory, a 400 line/min printer and three disk drives with a total of 90M bytes of storage capacity.

Conversion Procedure

"The IBM system was out on July 1 and the other system in on July 15," Williams said, adding the interim period was used to change some flooring and put in a stand-alone air conditioning unit.

The computer room, he noted, had been cooled by the central air conditioning unit, but when that had been down, some problems were encountered with the 3/10.

Conversion to the system was performed prior to its installation, Williams said.

The system has a unit called the "Liberator 3" that takes RPG-II programs and converts them into Honeywell RPG. "It's actually a one-for-one conversion," he said.

The conversion took about a month, he added, because, "we ran into some problems with the files on the 3/10. The 3/10 allows alpha information to be placed in a numerical field, so it took us longer to convert the files."

Applications being run on the system include billing, order entry, accounts receivable, accounts payable, inventory control and sales statistical information.

Weekly Forecasting

"The biggest thing we've done has involved historic information for informal forecasting," Williams said. The firm's production is not very complicated, so forecasting can be done on a weekly basis, he explained.

In addition to Williams, the seven-member DP department includes a manager in charge of programming and program maintenance, an operator, a control clerk to coordinate between departments and three data recording people.

Eventually the firm hopes to put CRTs in its manufacturing plants for an on-line sales order processing package, Williams added.

The Laser — OCR-ONE

Designed — to reduce your data entry costs

The unique Laser OCR-ONE is cost-justifiable for the replacement of only three key stations! That means you can now reduce your data entry costs in a multitude of typical business problem areas such as: Order Entry... Inventory Control... Payroll Accounting... Invoicing... and many more.

Latest Laser technology enables our System to read documents that are not scannable with most other systems because it's extremely tolerant of dirt, smudges and generally less-than-perfect documents.

The Laser OCR-ONE handles virtually any paper stock... reads pages and documents... features on-line character correction and has full alphanumeric capability. More than that, it reads 6 lines per inch of machine print and is user programmable with just a simple form.

Compare our performance, accuracy, versatility and ease of operation with other data entry methods. We believe you'll be convinced.

We'd welcome the opportunity to give you a demonstration and provide detailed information on the remarkable advantages of the Laser OCR-ONE. Contact me today for complete cost-saving information.

Billy Graham
Vice President/Marketing

Optical Business Machines, Inc.
804 West New Haven Avenue
Melbourne, FL 32901
305/727-1774

An affiliate of Florida Data Corporation

I'd like more information about the Laser OCR-ONE

- ☐ Please send descriptive literature
☐ Please have a salesman call me

Name _____

Title _____

Company _____

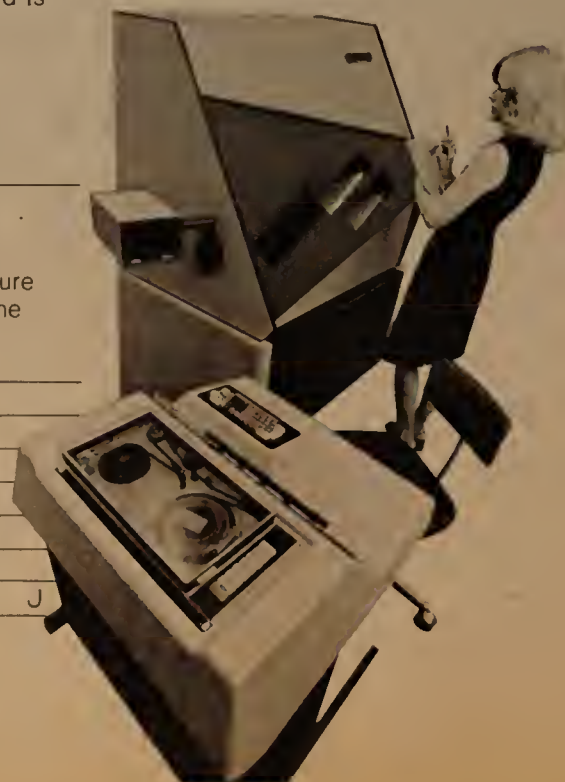
Address _____

City _____

State _____

Zip _____

Phone _____



FREE SOFTWARE

Why thousands of dollars for Payroll, Billing, Inventory, or Accounts Receivable software. Unlike other software cos. we don't believe in making all our profit off you! We have compiled a Library of Money making, Money saving! Advanced Business programs, all written in a language your computer will comprehend. BASIC. We also offer Games Eng, Stat, etc. For a little more than the price of the paper you could own tens of thousands of \$\$\$ worth of powerful software. Vol. III Ad. Bus-\$39.95. While they last. Add \$2 for hndl. plus postage. (Includes: A/R, Inventory, Payroll, etc. software) CASH/CK/MO/MC/BAC * S.R.I. 1712 Farmington Ct., Crofton, Md. 21114 For phone orders call: (301) 721-1148

Calcomp Witness Says

IBM Bastion Was Xerox's Major Stumbling Block

By Molly Upton
Of the CW Staff

LOS ANGELES — One of the principal reasons Scientific Data Systems (SDS) turned from a profitable company into an unprofitable unit after its acquisition by Xerox was the shift in management philosophy that sought to market systems in IBM's territory, the business DP arena, according to Dan L. McGurk, former president of Xerox Data Systems (XDS).

After initially agreeing that Xerox's goals to make XDS number 2 in the industry and to remain profitable were attainable, he soon changed his mind and told management it must pick one or the other, McGurk testified in the California Computer Products, Inc. (Calcomp) vs. IBM antitrust trial.

Prior to its May 1969 acquisition, SDS had a "sound strategic plan for our computer line and for our marketplace, which

was to attempt to fill the niches that were not well filled, that could be filled with current technology and little innovation, particularly the area of real-time control," he said.

SDS tried to stay out of the way of larger companies such as IBM, he said. Its systems were originally designed for scientific, real-time use.

McGurk characterized as "relatively unsuccessful" the firm's effort, begun after it became XDS, to find a market with a multiplicity of uses for its computer, such as scientific, time-sharing, on-line data collection and business. In this way the firm hoped to sell some systems for business DP by "piggy backing on our other strengths," he said.

Marketing to business DP users was difficult because they were used to the way IBM machines performed and were not

anxious to deviate, he said.

For instance, the NCR printer XDS used generated printout that was upside down and was not easily glanced at by the operator, he noted.

Customers disavowed XDS' rapid access "data file (RAD), consisting of a fast memory and tapes, insisting they needed disk drives because the IBM systems had them. So, although the designers thought the system didn't need disks, disks were added to appease customers' demands that the systems look like IBM gear, McGurk said.

As an example of the difficulty XDS had in the business market, McGurk said the Xerox campaign to replace Xerox corporate's IBM computers with XDS systems fizzled.

XDS learned its operating system was not of the same level as IBM's, in that its machines did not offer the handholding

that business DP managers had come to expect from IBM systems, he said.

In addition, the software conversion costs were so high that there would have been no savings in converting the corporate IBM systems to XDS, he said.

XDS customers were traditionally very knowledgeable computer users who did not require such handholding, he said.

With the infusion of new managers and philosophy after the acquisition, management was imbued with the idea of running XDS as if it were a large company with a dominant share of the market.

Although the new managers were capable in the type of business to which they were accustomed, they didn't understand the business that SDS had traditionally been in "where we had a small part of a specialized marketplace, where we had to be very fast on our feet to stay running and to stay growing," he added.

The company's profit picture changed markedly. In 1969, XDS had about \$25 million in pretax earnings. But in 1970, it had about a \$10 million loss, while from 1971-75 XDS lost over \$100 million, he stated.

The three principal factors responsible for the losses were the departure of the old management team, the infusion of the new team from Xerox and other firms and the move into business DP, he said, noting the recession contributed to the 1970 result, but not the other years.

Estimating the cost for Xerox to enter the computer business from scratch in 1969, McGurk said "entering the computer business is relatively easy. Designing a single computer and selling it to somebody, you have entered the computer business. That they could have done for a few million dollars. To become a factor in the computer business is an entirely different kettle of fish."

McGurk explained his answer to Xerox that XDS could rise from having barely 1% of the market to a number 2 slot and remain profitable.

"We, being brash and self-confident and looking at the resources of Xerox and how good we thought we were, said, 'yes, we can do those two things together. It will take between five and eight years,'" he said.

However, he changed his mind by spring of 1970, he said.

'Industry's Bellwether'

Financial Analyst Predicts IBM Stock to Split

By Toni Wiseman
Of the CW Staff

NEW YORK — An analysis of IBM stock splits from 1954 to the present has led a Wall Street analyst to conclude that IBM may split its stock on January 25, 1977 — a step which could spark renewed interest in the stock.

This would be good news for the entire industry since "IBM stock is the bellwether of not only the equipment group but the electronics group as well. And when its price-earnings ratio is dampened as it is now, it puts a damper on the whole technology group," according to Harry Edelson of Drexel Burnham Lambert Group.

"But, if IBM were to split and its stock were to rise, that would have very nice overtones for the entire technology group, too," he said.

In Armonk, an IBM spokesman indicated that the stock split is "just speculation on the part of an analyst and it is not our practice to comment on speculation."

IBM is currently the highest priced listed common stock, selling around \$270 in a market where only three or four stocks sell at over \$100, according to Edelson.

AT&T, for instance, is around \$63, Exxon around \$53 and General Motors around \$78.

Edelson believes IBM may split its stock three for two, or five for four. The estimate of the size of the split may be only an educated guess, but the estimate of the date is probably quite accurate, he said, noting that in the past, IBM has always announced its stock splits on the last or next to the last Tuesday in January, concurrent with the monthly meeting of its board of directors.

IBM's stock first split, 5 for 4, in 1954, and eight times since then: 5 for 4 in 1956, 2 for 1 in 1957, 3 for 2 in 1959, 3 for 2 in 1961, 5 for 4 in 1964, 3 for 2 in 1966, 2 for 1 in 1968 and 5 for 4 in 1973.

Edelson based his prediction on several considerations: the normal interval between splits, the level of earnings per share in the year of the split, the stock price just before the announcement of a split and several "intangible influences" as well.

A major factor will be IBM's desire to broaden its base of shareholders, in part because of its antitrust suits and potential regulatory problems in light of its entry into the communications field, he said. AT&T, for instance, has 3 million shareholders while IBM has only 600,000.

Institutional investors are becoming more and more important in the market and the small investor is being pushed out, he said, noting that the small investor accounts for only about one-third of the New York

Exchange's volume.

"But pension laws are forcing some major institutions to cut down on their stock purchases in companies in which they have too great an investment, and where else can IBM compensate but small investors," he asked.

Luring Small Investors

Low price and high dividends are what attract small investors, he said.

"IBM increased its dividend substantially which is likely to lure small investors, but the cart was before the horse because the price is still too high," he stated. "But if they cut the price, with the high dividend, that combination is likely to lure small investors."

IBM, he noted, pays the highest dividend of all office equipment stock, over a 3% yield.

Edelson suggested IBM didn't split in 1976, as some had said it would, because the stock had been lower and the earnings higher than had been expected.

In 1973, the average price-earnings ratio for IBM stock was 28.5. Before 1973, IBM's average was never less than 33, he noted.

At the time of the board of directors' meeting in January 1976, IBM carried a price/earnings of 19 times 1975 earnings and 17 times general estimates of 1976 earnings, Edelson said, concluding that "if IBM's ratio had been at its historical level of 30-50 times earnings in 1976, a stock split would have occurred."

"So, although IBM's earnings per share were high enough to warrant a stock split, the price of the shares was too low," he said.

Edelson predicted that the stock would rise after the forecast split since the stock peaked at 365-1/2 (adjusted) on Feb. 13, 1973.

In May 1973, however, IBM stock began a two-year decline, sinking to a low of 150 1/2 in Oct. 1974.

IBM's stock price has now recovered to a level that is higher than on the dates of all previous stock-split announcements except for the last one on Jan. 23, 1973, he said.

"Therefore, low price/earnings ratio notwithstanding, [I] think it is highly possible that IBM will split."

IBM's current ratio is 18.

Cbema Cites 'Institutional Uncertainties' As Barrier to Development of EFT Systems

SAN FRANCISCO — The prompt resolution of questions regarding institutional arrangements for those involved in electronic funds transfer (EFT) systems is a key problem for manufacturers, according to the Computer and Business Equipment Manufacturers Association (Cbema).

"To date, the most significant obstacle to entry by manufacturers into the EFT market does not flow from their competitive relationships to each other," Cbema's President Peter F. McCloskey told the National Commission on EFT here recently.

"Rather, the principal uncertainties are in terms of the institutional arrangements within the financial community, for example, the unresolved branch banking questions, and the communications field — involving the role to be played by regulated communication common carrier entities in future EFT developments."

"In all likelihood, these institutional uncertainties have affected the market's response in terms of innovative offerings and may well have led some manufacturers and service vendors to act more cautiously

than they might otherwise have done," he noted.

Commenting on the impact of competition between regulated monopolies such as AT&T and unregulated suppliers of EFT services and equipment, McCloskey pointed to the Transaction Network Service (TNS) offering of the Bell System as an example of the uncertainties which exist concerning the future role of regulated communications common carriers in the EFT field.

McCloskey suggested that AT&T intends TNS to provide services similar, at least in part, to those provided by the developing proprietary switching systems (switches).

"However, for the EFT switches to develop and meet the needs of the financial, business and consumer communities effectively, it is evident that their activities must also encompass critically important DP and recordkeeping capabilities."

"It is entirely likely, therefore, that the thrust of regulated common carrier activity will include an effort to expand into these DP and recordkeeping fields in order to develop new market opportunities for

themselves," he said.

"But, the net effect of such a development could well be a serious derogation of existing public policy precluding the offering of DP services by regulated communications carriers within the framework of their regulated and tariffed communications offering," he said.

While Cbema supports competition, in its view, new entrants, such as the common carriers, should not be unfairly favored as a result of their base of operations in the franchised, publicly licensed communications business, McCloskey stated.

He asked that existing policies requiring that any regulated carrier providing DP services must do so through a wholly separate subsidiary be reaffirmed explicitly in terms of the EFT field.

McCloskey noted Cbema's view that "the provision of TNS by the Bell System raises serious questions of cross-subsidy of the TNS service by Bell's monopoly service."

"It may well be that the general telephone user and other Bell customers are being forced to pay part of the cost of TNS," he added.

In Response to Datapoint Suit

CA Files Antitrust Suit Against Datapoint, Others

By Toni Wiseman
Of the CW Staff

LOS ANGELES — Computer Automation, Inc. (CA) has filed suit in federal court here charging Datapoint Corp., TRW, Inc. and TRW Datacom International with conspiracy and monopoly in violation of federal antitrust laws.

The suit — which asks for treble damages and an injunction enjoining the further prosecution of a Superior Court Action brought by Datapoint in 1975 against CA — charges the three defendants with restraint of trade, boycott of CA Commercial Systems Division products and monopoly of relevant market areas in which CA and Datapoint compete.

This is a sequel to a continuing saga since Datapoint has a suit against Computer Automation filed in the Los Angeles County court since May 1975.

In San Antonio, Datapoint would not comment on the merits of the case, indicating that it has "adopted a policy that we will not try these cases in trade papers rather than in a court where they belong."

Datapoint has, however, filed a motion to

stay action on the CA suit until resolution of its suit.

A spokesman from TRW's headquarters in Cleveland said the firm is "thoroughly familiar with the claims and thinks they are without merit." TRW is therefore taking the "normal litigation procedures," he said.

Datapoint Trade Secrets

CA allegedly acquired the Syfa software system from Datapoint's distributor in the Republic of South Africa, Computer Advances (Pty.) Ltd.

In the case in county court, Datapoint charges CA and Ivan Socher and other former principals of Computer Advances with trade secret theft. It seeks damages of more than \$1 million and exemplary and punitive damages of \$5 million.

Datapoint said it expects that case to come to trial within six months.

Datapoint charges that its trade secret information, such as source codes for its systems, specifically Datashare, were misappropriated and used in the "development" of the Syfa system.

The Texas firm also seeks to enjoin defen-

dants from selling or leasing a computer product which in any manner uses Datapoint trade secrets.

CA Cites Conspiracy

CA alleges that TRW's TRW Datacom International unit, acting as foreign distributor for Datapoint products, threatened in 1974 to withhold new Datapoint technology and products from Computer Advances of Johannesburg, South Africa, unless it ceased demonstrating, promoting and selling Computer Automation's Syfa system.

Computer Advances is the South African distributor for both CA and Datapoint.

As a result of this "conspiracy"—the Syfa system has been effectively "boycotted" in South Africa, the suit contends.

The suit further alleges the conspiracy continued with the filing of a "groundless" lawsuit against CA by Datapoint, alleging the misappropriation of Datapoint trade secrets. The suit was prepared with the assistance of TRW, CA alleges.

CA's complaint also alleges that Datapoint brought its suit as part of an overall scheme to monopolize their particular

market and eliminate CA from competing in this marketplace.

CA is asking for unspecified treble damages for loss of profits, for substantial legal costs in defending against the action, and for being illegally excluded from a foreign market, as well as for loss of confidence by customers and the financial community.

Datapoint's response counters that the suit consists of the same claims as the action in county court, "couched as an antitrust action."

CA filed the claim in order to disrupt proceedings by imposing the burden of multiple litigation on Datapoint and the courts, Datapoint charged.

After Datapoint filed its suit in county court against Socher and associates, but before it named CA as codefendant, CA previously filed an action in federal court but this was dismissed and CA entered a cross complaint in county court.

Judge Warren A. Ferguson is expected to rule Jan. 17 on Datapoint's motion to stay action on the filings in federal court.

NEWS RELEASE: Now available from Dearborn S/360 software to match your size.

You don't need a million bytes of core to need better throughput. A simple spooling package, for as little as \$65 a month on a 36-month rental, could pull your production out of the hole.

So we've taken our award-winning DOS/RS software and created subsets to aid systems that don't want or need elaborate help.

With this new DOS/RS Power Line, you select what you need, and that's all you pay for.

Dearborn's software support and training help have been given four-star ratings. Every package is upward compatible.

DOS/RS FULL™: If you need three full processing partitions, and work with a core size of at least 128k, this merit-winning software may be the help you've been looking for.

It delivers six partitions. There's teleprocessing support, plus a built-in sophisticated spooler called Power-III.

With DOS/RS FULL you take advantage of 370 devices like 3330 disk drives. You enjoy new inter-partition scheduling flexibility, and throughput enhancements of such features as resident directories and transients.

A host of features are outlined in our free twenty-page reference manual. Send for it now.

DOS/RS FULL is available on permanent license, or monthly rental for as low as \$400.

DOS/RS BASIC III™: If you need the super-spooling help of Power-III, but use only two processing partitions; this subset of the full system may be ideal for you.

It offers multi-programming enhancements and inter-partition scheduling flexibility, but you only pay for what you need. As you add core and devices, it's easy to upgrade to the full system.

Permanent license, or monthly rental as low as \$290.

DOS/RS BASIC I™: This software is perfect for the shop that's running one processing and one TP partition on one shift, and two processing partitions on other shifts.

Even with limited core, it permits you to share the efficiencies of multi-programming and spooling. Permanent license, or monthly rental as low as \$160.

POWER-I™: When it comes to cost and core, this spooling software is as miserly as they come. Yet, it's generous in features: supports one or two partitions, offers early print start and is simple to install. It's upward compatible with Power-III. Permanent license, or monthly rental as low as \$65.

SIM 14™ executes 1400 programs on any 360 or 370 under any operating system. It needs no hardware emulator features. Permanent license, or monthly rental as low as \$500.

Write for the specifications, or call Lou Haberbeck at (800) 323-0248.

Illinois residents call (312) 671-4410



dearborn computer
leasing company

4849 n. scott st., schiller park, IL 60176
chicago (312) 671-4410 • toronto (416) 621-7060
st. louis (314) 727-7277 • houston (713) 965-0788
detroit (313) 358-3397 • los angeles (213) 820-1097

Gentlemen: Tell me more about

☐ DOS/RS FULL ☐ DOS/RS BASIC III ☐ DOS/RS BASIC I ☐ POWER I ☐ SIM14

NAME/TITLE _____

COMPANY _____

ADDRESS _____

CITY/STATE/ZIP TELEPHONE _____

...Anrix Also Sues Datapoint Charges Monopoly of Mini Mart

PHOENIX, Ariz. — Anrix Corp. has filed suit against Datapoint Corp. charging unfair competition, restraint of trade and attempted monopolization of the market for minicomputers.

The suit alleges Datapoint adopted a deliberate policy of refusing to enter into maintenance agreements or provide repair

service, on a time and materials basis, for all Datapoint equipment presently in use except for equipment that is purchased or leased directly from Datapoint.

Anrix, a distributor of new and used minicomputer systems, is seeking damages in excess of \$2.5 million and injunctive relief.

In Boston... In Dallas... In Orange County, and in six other cities, OEM decision-makers meet the country's top computer and peripheral manufacturers at the Invitational Computer Conferences — the only seminar/displays designed specifically for the unique requirements of the quantity user. In one day, at each 1976/77 ICC, guests will receive a concentrated, up-close view of the newest equipment and technology shaping our industry, presented by such companies as:

Amcomp, Braegen Corp., Calcomp, Computer Automation, Computer Operations, Control Data Corp., Data General, Dataram, Diablo, Digi-Data, Diva, EECO, Emerson Electric, General Automation, General Systems Int'l, General Instruments, Hewlett Packard, Houston Instruments, Interdata, ISS/Sperry Univac, Lear Siegler, MDB Systems, Microdata, Mohawk Data Sciences, Omron, PerSci, Pertec, Pioneer Magnetics, Printonix, Remex, Shugart Sykes Datatronics, Tally, Threshold Technology, Varian, and Wangco.

The Schedule for the 1976/77 Series is:

September 8, 1976 Newton, Mass.
October 26, 1976 Chicago, Ill.
October 28, 1976 Minneapolis, Minn.
November 18, 1976 Dallas, Texas
January 18, 1977 Orange County, Calif.
February 14, 1977 Ft. Lauderdale, Fla.
March 15, 1977 Palo Alto, Calif.
April 26, 1977 Hempstead, L.I.
April 28, 1977 Philadelphia, Pa.

OEM AMERICA MEETS at the Invitational Computer Conferences



Invitations are available from participating companies or the ICC sponsor. For further information contact: B. J. Johnson & Associates, 2503 Eastbluff Drive, Newport Beach, Calif. 92660 (714) 644-6037.

Time-Sharing Seen Losing Ground as Service Choice

NEW YORK — Total time-sharing industry revenues were approximately \$640 million in 1975, a figure which should reach \$1 billion in 1984, according to Frost & Sullivan, a market research firm.

The New York firm predicted that while the DP sector as a whole will grow at about 18% a year through 1984, resulting in expenditures that year of some \$87 billion, time-sharing's share of the revenues will decline.

"Vendor profitability will [also] decline, falling from a current industry average of about 11.5% to no more than 5.3% by 1984," the report said.

"The declining importance of time-sharing is only one facet of a profound and continuing shift in the mix of services offered by remote computing services (RCS) vendors," the report said.

Documation Hits Telex With Suit

MELBOURNE, Fla. — Documation, Inc. has filed a countersuit against Telex International and Telex Computer Products charging them with restraint of trade, monopolistic practices and unfair competition.

The suit is in response to Telex's filing charging Documation with a breach of contract resulting in damages of more than \$10,000. The contract was an agreement under which Telex would market Documation's Doc 2250 printer overseas.

The Documation suit denies all Telex allegations and claims Telex itself breached the contract.

The suit further alleges Telex "engaged in activities which constituted a combination, conspiracy and an unreasonable restraint of trade in violation of Section 1 of the Sherman Act," as well as violations of Section 2 of that act and Section 3 of the Clayton Act.

Documation is seeking triple damages as well as court costs.

ICL Forms U.S. Arm To Sell Singer Gear

EAST BRUNSWICK, N.J. — International Computers Ltd. (ICL) has formed a wholly owned U.S. subsidiary, incorporating Gogar Corp. and other operations of the Singer Business Machines (SBM) Division with ICL USA Ltd.

ICL, Inc.'s initial product line will consist of the former Singer/Cogar System 10 and 1500 series and ICL's 2900 system series.

Marketing and sales operations are scheduled to begin Feb. 1 at headquarters here under the direction of Geoffrey D. Rowett, president of marketing.

Frank Connors, president of the Operations Division, will oversee all manufacturing and research operations, which will be housed in the Cogar plant in Utica, N.Y. Connors was most recently in charge of Cogar and SBM operations in Albuquerque, N.M.

ICL, Inc. will provide service and maintenance for its products through a network of regional offices, a spokesman said.

Graham Settles Suit

Brought Over Prospectus

GRAHAM, Texas — Graham Magnetics, Inc. has agreed to settle a class action suit filed against it in 1975 which charged Graham with publishing misleading and incomplete information in its prospectus and corporate reports.

The settlement, ordered by the U.S. District Court for the Northern District of Texas, Dallas Division, calls for Graham and certain of its officers to pay \$821,825.

Graham said it denied any wrongdoing but deemed it prudent to settle the suit rather than pay future attorneys' fees for the litigation.

"Due to growing user sophistication, saturation of traditionally lucrative customer segments, and more direct competition with the autotransaction industry as well as the products of the burgeoning minicomputer industry, the RCS vendor must strive to remain viable in a buyer's market. His possible countermeasures are both limited and expensive," the report stated.

The firm said it based its predictions on intensive interviews with 50 users located in 15 major metropolitan areas. The 50 users had aggregate 1975 RCS expenditures of about \$40 million.

The industry time-sharing (T/S) trend is toward constant availability, the report said. The T/S services of the ten leading vendors are available to industry users for an average of slightly over 115 of the 168 hours in a seven-day week; all leading vendors operate on Saturdays; and only two leaders shut down on Sundays and

holidays.

Most of the industry leaders are full service vendors, offering T/S-related services such as remote job entry (RJE), extensive application libraries, training and technical support, according to Frost & Sullivan.

Few Offer Leasing Services

While only a few do not engage in contract programming, facilities management, and/or consulting, only a few offer equipment leasing services.

"Despite professed plans to the contrary, market factors will impel those T/S vendors inactive in certain of those related service areas to enter them," the report predicted.

Current vendor-published prices vary widely, Frost & Sullivan found, with connect charges varying from \$9/hr to \$22/hr; I/O charges from zero to \$1.65/thousand characters transferred; and mass storage from 17 cents to 62 cents/thousand charac-

ters per month.

The T/S leaders represent every major hardware vendor: Honeywell, Control Data, Xerox and Digital Equipment Corp., but over a third of all installations are IBM. Most installations are multivendor, however, the interviewers found, with mainframe brands/vendor approaching two.

"Replacement of front-end processors is proceeding rapidly, occasioned by the growing prevalence of dual-mode (T/S and RJE) systems and broader support of higher line speeds," the study stated.

As to operating systems, "the gradually emerging current generation is all vendor-custom, dual-mode and compatible with all possible line speeds," the report said.

"Thanks primarily to the number of IBM mainframes and the available TSO, neither dual-mode nor custom systems incidence is likely to reach 100%, but will approach that figure," it said.

Is there a difference between their NCR 655 Disc Pack and ours?



Yes...price.

Our NCR 655 Disc Packs are available at \$95 each in orders of seven or more and \$105 apiece for six or less. If you would like more information regarding our NCR 655 Disc Packs, as well as our full line of data processing equipment and supplies, just fill out and mail the coupon for our complete catalog. Or if you want instant action, call us today toll free. (800) 348-0806. (INDIANA RESIDENTS (800) 552-4789)



Please send me a **FREE** catalog detailing the NCR 655 Disc Pack and your complete line of data processing equipment and supplies.

Name

Company

Title

Street

City

State Zip

Phone: ()

MAIL TO: NATIONAL DATA PRODUCTS, INC.
11910 Bluffton Road, P.O. Box 9128
Fort Wayne, Indiana 46809

Standards Indispensable

NEW YORK — It would be foolish for the Federal government to assume the responsibility for standards development, according to the chairman of the Federal Trade Commission (FTC).

"The main virtue of private standards is that they respond to and reflect market forces. A government-controlled system would be unacceptably more likely to politicize the marketplace," Calvin Collier told attendees at a meeting sponsored by the American National Standards Institute (Ansi) here recently.

Standards are indispensable and, properly administered, they are highly beneficial. But, the FTC is also worried that standards may also impair competition, he said.

"Almost by definition, standards eliminate alternatives. Since quality competition is every bit as important to consumers as price competition, we must be concerned about restrictions on it," Collier stated.

Purely voluntary standards pose fewer problems to competition than their mandatory first cousins in the sense that the legal or practical inhibitions on departing from them are relatively minimal, he explained.

But, "even the purest voluntary standards can limit competition by their very existence. They can diminish incentives for improvement so that producers have little reason to refine their products past the plateau level that meets the standard," he continued.

The problem is that "the purely voluntary standard, if not already extinct, occupies a place on the endangered list just behind the whooping crane," Collier stated, adding a veritable web of federal, state and local laws and procurement documents incorporates private and ostensibly voluntary standards.

"Creeping governmental adoption of voluntary standards multiplies and cements whatever anticompetitive effect may flow from those standards, he said.

Ex-SDS Vice-President Testifies

'Greater Good' Extraneous in Marketing

LOS ANGELES — "Good guys generally don't finish first," Daniel McGurk, former vice-president of Scientific Data Systems (SDS), wrote to his boss in explaining that "business ethics are not the same as personal ethics."

McGurk's 1965 memo, which was entered as evidence while he testified at the California Computer Products, Inc. (Calcomp) vs. IBM trial here, outlined business practices he condones.

It apparently dissuaded R.M. Beck, executive vice-president of SDS, from issuing a position paper, "Business Conduct Policy," which McGurk indicated stressed concepts such as "contribution to society" and "the greater good."

"If we muddle our minds with 'such concepts' it won't help us achieve our objective of profit which alone optimizes the use of resources in our economic system," according to McGurk, who was associate director of the Office of Management and Budget in the Ford Administration.

Profits and ethics are, "in my

opinion, completely separate questions and completely separate problems which should not be confused."

In explaining his philosophy, McGurk said he did not think any of a "number of schemes, devious, dirty, mean and ruthless, are incorrect behavior in pursuit of corporate goals."

However, a number of steps most marketing employees would not consider morally wrong are generally bad business, he added.

These include disparaging competition, impugning the motives of unfriendly customer personnel, making promises that cannot be met or getting business by reciprocity, he stated.

Guidelines for Selling

McGurk outlined partial guidelines for selling situations.

"Tell the truth, although it is not necessary to blurt out all the unfavorable truths," he said.

One shouldn't criticize competition directly, but rather "show up competition's weakness by emphasizing [one's] corresponding strength, in a way that causes favorable comparisons in the customer's mind."

"Do not use blackmail, bribery or theft on a customer," he warned.

However, "gaining information by friendship, getting customer personnel inebriated, reading material on his desk, copying

material customers lend us, or any other legal means is acceptable," he stated.

He also admonished that the same price should be offered to all customers under the same conditions in order to avoid unfair competition as defined by the Robinson-Patman Act.

RUNNING CDP REVIEW COURSE?

Course outline for your guidance. \$10 postpaid; \$15 invoiced against P.O.

THE NEW DIVISION
Box 913
North Chelmsford,
MA 01863

VOLUME KEY PUNCHING (402) 592-1686

"QUALITY AT LOWER COST"
AMERICANA KEY PUNCH
4345 South 89th St.
Omaha, Nebraska 68127

GO GREYHOUND



WHEN LEASING COMPUTER EQUIPMENT

AVAILABLE IMMEDIATELY:		360/30, 360/50, PHOENIX I/O TAPES, 2314 COMPATIBLE DISKS	
U.S.	East	Tom Ryan	(617) 272-8110
	Central	Jerry Rogers	(412) 922-8920
	West	Dave Hyland	(415) 283-8980
International	Canada	Don Maunder (Toronto)	(416) 366-1513
	U.K.	Bruce Pearson (London)	(01) 759-9191
	Europe	Joe Gold (Geneva)	(022) 61-27-54
	Mexico	Andres Contreras	(905) 543-6850
	Austro-Asia	Don Haworth	(214) 233-1818
Non-IBM	Dallas	John Hallmark	(214) 233-1818

Greyhound Computer Corporation Greyhound Tower Phoenix, Arizona 85077

Executive Corner

■ Stephen D. Bechtel Jr., chairman of the Bechtel group of companies, has been elected to the board of directors of IBM.

■ Louis H. Benzing has been elected president and chief executive officer at Decision Data Computer Corp.

■ Harry Dornbrand has been elected president of American Satellite Corp., a subsidiary of Fairchild Industries, Inc.

■ Max Hugel has been appointed executive vice-president and elected to the board of directors of Centronics Data Computer Corp.

■ George E. Dashiell has been appointed corporate vice-president and general manager for the Naked Mini Division of Computer Automation, Inc.

■ Robert E. Vernon has been named vice-president of marketing and business planning for Univac's Europe-Africa-Asia Division headquartered in London.

■ Yale Grayson has been appointed vice-president for Systems Development at Electronic Tabulating Corp. (ETC).

■ LeRoy C. Ostrander has resigned as a director and vice-president of Documentation, Inc.

■ Norman H. Ukeiley has been appointed vice-president and program director of ITT Corporate Communication Services, Inc.

■ John Phillip Carley has been appointed vice-president/sales by Systems Engineering Laboratories, Inc.

■ Brian D. Wiltshire has been appointed vice-president and director of the marketing division of On-Line Systems, Inc.

■ Gregory Lewis has been named vice-president of credit card services and Orazio Manzi-Fe Pater has been named vice-president of cash management for National Data Corp.

FIND MINI-SOFTWARE SERVICES FAST MINICOMPUTER SOFTWARE DIRECTORY

Instant access to descriptions of hundreds of minicomputer software packages and services.

DIRECTORY INDEXED 4 WAYS
• Indexed by applications and services
• Profiles of supplier companies
• Geographic locator
• CPU's supported by suppliers

Annual Subscription \$70

INITIAL ISSUE plus 2 updates Send check or PO
MINICOMPUTER DATA SERVICES
20 COVENTRY LANE, RIVERSIDE, CT. 06878



Plug In High Performance \$950.00

single quantity



Techtran 815 DATACASSETTE

Now For The First Time Anywhere...
A super low cost, plug compatible,
DIGITAL CASSETTE RECORDER!

Featuring:

- 145,000 character storage
- Terminal & Modem/CPU Interfaces
- Automatic send/receive

Call or Write Today!

Techtran Industries, Inc.
580 Jefferson Road
Rochester, N.Y. 14623 U.S.A.
Tel: 716-271-7953
TWX: 510-253-3246

TECHTRAN
INDUSTRIES

DO YOU THROW THESE AWAY?



RECYCLE INSTEAD!

Cloth Ribbons can be RECYCLED up to 3 TIMES at a LARGE SAVINGS! For Example:

	monthly usage				
Diablo Hytype I	1 to 12	13 to 48	49 to 143	144 to 488	489 to 812
Cloth Cartridge Ribbons	\$1.80	1.70	1.60	1.50	1.35 1.20

Aspen Ribbons' recycled products are guaranteed to perform like new! To prove this we would like to RECYCLE 2 SAMPLES for you AT NO CHARGE!

MAIL ANY OF THE FOLLOWING TODAY!

Diablo Hytype I & II IBM Cartridge
Xerox Hytype I & II IBM Harmonica
Burroughs Interdata
Qume Wang

We also supply new Diablo and Xerox Hytype I & II Cloth and Carbon Ribbons at discounted prices

Aspen Ribbons

1700 N. 55th St. / Boulder, Colorado 80301 / (303) 444-4054

Earnings Reports

COMPUGRAPHIC			
Year Ended Oct. 2			
	1976	1975	
Shr Ernd	\$3.65	\$3.16	
Revenue	95,270,000	74,404,000	
Earnings	7,504,000	5,841,000	
3 Mo Shr	.89	.81	
Revenue	24,790,000	18,552,000	
Earnings	2,015,000	1,518,000	

ANDERSON JACOBSON			
Three Months Ended Sept. 30			
	1976	1975	
Shr Ernd	\$1.11	\$0.9	
Revenue	5,255,914	4,391,832	
Earnings	262,090	227,215	
6 Mo Shr	.21	.17	
Revenue	9,997,132	8,430,363	
Earnings	496,271	421,787	

APPLIED DATA RESEARCH			
Three Months Ended Sept. 30			
	1976	1975	
Shr Ernd	\$3.1	\$0.8	
Revenue	3,934,077	2,919,354	
Tax Cred	21,000	47,000	
Earnings	381,150	97,734	
9 Mo Shr	.93	.20	
Revenue	11,166,874	9,486,558	
Disc Op		(131,840)	
Tax Cred	384,000	115,000	
Earnings	1,136,916	240,692	

POSITION ANNOUNCEMENTS

PROGRAMMER/ANALYSTS AND SYSTEMS ANALYST 18-24K

Intermediate to senior level
If You Can Answer These Number 5 Questions off The Top Of Your Head, You're The Person We Want to Speak To.

FOR DETAILS, PLEASE SEE OUR DISPLAY AD ON PAGE 15.

MANUFACTURERS HANOVER

An Equal Opportunity Employer M/F

ASSISTANT COMPUTER SCIENCE INFORMATION SYSTEMS

Fall 1977. Competencies in Computer Science Core, systems analysis, architecture desirable. Ph.D. required. Apply by February 15 to Dr. John Dalphin, SUNY, Box 620, Potsdam, N.Y. 13676. An Equal Opportunity/Affirmative Action Employer.

SYSTEM PROGRAMMER

Immediate opening — one to three years of experience on UNI-VAC 1100 Series Computers. Must have a working knowledge of ECL for OS1100 (EXEC 8), assembly language and FORTRAN or COBOL. Experience with TIP/CMS/DMS systems desirable. An excellent position in a growing, dynamic northwestern Ohio data processing center. The Center's clientele includes the University of Toledo, Bowling Green State University, the Northwestern Ohio Regional Planning Unit and the City of Toledo. Liberal employee benefits and educational opportunities. Salary \$13,000-\$18,000 depending on education and experience. For more information, contact Mr. Terry Moenich, (419) 874-4315 or write to JPLRCC, Lewis Development Park, 25875 Dixie Highway, Perrysburg, Ohio 43551.

"An Equal Opportunity Employer"

position announcements

position announcements

SOFTWARE ARCHITECT

SEI is a growing data processing consulting organization of 39 people, with a broad range of major Chicago based clients in industry and government. SEI expects hard work and a willingness to learn, and provides rewards to match, including rapid advancement, compensation for all time worked, and a good benefit package. Increased business has opened two positions for top flight system specialists to develop and enhance SEI proprietary software. Primary areas of involvement are packages for data base management, online system performance monitoring, and online system development support. Much of the work will be on major online systems with data bases in the 5-10 billion byte range. Applicants should have a minimum of 8 years of significant programming experience concentrated in IBM 360/370 and a thorough knowledge of BAL. Salary: \$24,000-\$32,000.

Send resume and salary requirements in confidence, or call:

SEI

computer services

Attn: F.N. Umeh
450 East Ohio Street
Chicago, Illinois 60611
(312) 943-5116

An Equal Opportunity Employer M/F

position announcements

position announcements

PROGRAMMER/ANALYST

Steelcase Incorporated, the world's leader in the manufacture of office furniture has an excellent opportunity for an individual seeking challenge and outstanding career growth potential.

To be considered for this position you must have a minimum of 2 years programming and systems design experience using COBOL and CICS in an OS or BS teleprocessing environment. Applications background in manufacturing and a B.S. degree are preferred.

As a world leader we offer a competitive salary, comprehensive benefits, and lots of room for growth. Submit a personal resume with salary history in confidence to:

Tim E. Tyler
Assistant Employment Manager

STEELCASE, INC.

1120-36th St. S.E.
Grand Rapids, MI. 49501

Equal Opportunity Employer M/F

position announcements

position announcements

SOFTWARE SPECIALISTS

NEEDED IN:
Virtual Systems

To participate in the planning, design and installation of a conversion from OS to SVS. Three-four years' experience in ALC and SYSGENS. Telecommunications and CICS experience desirable.

Timesharing

Three-four years' experience in operating systems, internals, timesharing control program and telecommunications.

Excellent salary, top benefits and growth potential with this energy leader. Send complete resume including salary history to the Personnel Dept.:

AMERICAN NATURAL SERVICE COMPANY
One Woodward Avenue
Detroit, Michigan 48226

An Equal Opportunity Employer M/F

position announcements

position announcements

SUPER MINI PROGRAMMER

We Offer: Good Pay
Hard Work
No Nonsense

No ordinary Programmers need apply.
(212) 425-8808

WANTED

SYSTEMS SOFTWARE PROGRAMMER

Male or Female
For Large Michigan Company
Located in the Detroit Area

Requirements:

- 1-3 years MVS Systems Programming experience on IBM 370/168 or 158 MP installation.
- Knowledge of and experience in BAL necessary.
- Telecommunications, CICS, or IMS experience beneficial but not required.
- Operations Technical Support experience helpful.

Attractive salary program and excellent fringe benefits program. Send resume to:

CW Box 4877
797 Washington St.
Newton, Mass. 02160

An equal opportunity employer.

position announcements

position announcements

MANAGER SYSTEMS DESIGN & PROGRAMMING

As a growth-oriented Cleveland based manufacturing firm, we are searching for a dynamic professional who is eager to join the management team of the company's Corporate Systems Staff.

This individual should possess a Bachelors degree plus 6-8 years experience in Systems with a minimum of 2 years in a managerial position. Graduate education desirable.

Company utilizes IBM main frames under OS, operates a real-time and remote batch TP network as well as providing local batch services.

If you can qualify and are looking for a challenging opportunity to realize your management potential, send your resume in confidence including salary history to:

CW Box 4874
797 Washington St.
Newton, Mass. 02160

Equal Opportunity Employer M/F/H

position announcements

position announcements

COMPUTER PROFESSIONALS

Our Client, a Fortune "500" Company of Consumer Products and a leader in their field has a need for several data processing professionals with ambitions to work in one of New York States most sophisticated installations.

Corporate Headquarters are located in the foothills of the Adirondack Mountains — minutes away from Albany, Schenectady and Saratoga Springs, New York.

We are planning a comprehensive data basis for a large number of complex systems now in effect. To meet the challenge, the selected candidates should have a minimum of three years data processing experience and at least two years hands-on experience with large scale systems, preferably in a Manufacturing or Financial Environment.

Experience in Inventory Control, Order, Entry or Distribution Systems would be a PLUS.

- SENIOR SYSTEMS ANALYST \$25,000
- MANUFACTURING SPECIALIST \$22,000
- SENIOR SYSTEMS ANALYST \$20,000
- SYSTEMS SPECIALIST \$18,000
- MINI-COMPUTER SPECIALIST \$18,000

Career Advisors

125 Wolf Road — Albany, N.Y. 12205

(518) 458-1810

Our client companies assume all fees

position announcements

position announcements

position announcements

position announcements

position announcements

APPLICATION and TECHNICAL PROGRAMMERS

These openings are due to an expanded scope of data processing objectives including an accelerated Material Control Program.

Here is your opportunity to join an organization that is being geared for productivity and results. We are providing our users with current data using On-Line Systems, with a corporate data base for economy and a network of communications for efficiency. Our company has a performance oriented management that provides challenge and opportunity for personal growth in all functional areas. Selected candidates should have 2-3 years working experience of COBOL or ALC. Our hardware/software environment is IBM 370/158, VSI operating system. We are migrating to MVS, IMS and TSO, experience in these areas is a definite plus.

Send complete resume with salary history to: Mr. Jerry Hope

ESSEX GROUP

Subsidiary of
UNITED TECHNOLOGIES

1601 Wall Street
Fort Wayne
Indiana 46804

We are an equal opportunity employer interested in receiving inquiries from qualified minority and/or female candidates.



COMPUTER PROGRAMMER

Large Chemical Company has need for an experienced Computer Programmer. Responsibilities will include writing, testing, debugging and implementing new programs and modifying existing programs. Minimum 2 years experience. IBM COBOL with OS-JCL, DL-1 and IMS a plus. Degree preferred. Send salary requirements and resume to:

Mgr. of Industrial Relations
Occidental Chemical Co.
P.O. Box 198
Lathrop, Calif. 95330
An Equal Opportunity Employer M/F

PROGRAMMER/ANALYST

All it takes is 2-3 years of programming experience in COBOL or ALC in a 370 environment to join a progressive data processing department of a life insurance company in Battle Creek, Michigan. Challenging opportunities exist within the following framework:

- MVS-370/168, DOS/VS - 370/145
 - Remote Processing/Data Transmission
 - On-line Test/Debug - TSO, VM, CMS
 - IMS Data Base Management
 - CICS On-Line Systems
- Additional experience in any of the above, a plus. Interested?? Send your resume, including salary history and requirements to K.C. Brown, Federal Life and Casualty Co., 78 West Michigan Avenue, Battle Creek, Michigan 49016. *Equal Opportunity Employer*

EDP CONSULTANT/ MANUFACTURING SYSTEMS

Large international CPA firm located in New York City seeks an experienced EDP programmer/analyst to support consulting engagements with manufacturing clients requiring systems for MRP, Inventory Control, Job Cost, Shop Floor Control, Capacity Planning and Master Scheduling.

Your responsibilities in this important position would be to support, on a National level, a comprehensive manufacturing, planning and control system implemented on both small computers and minicomputers. Duties would include: assisting local office consultants working with manufacturing clients, design, development and testing of enhancements to the manufacturing control system, and development and maintenance of training and reference materials.

You must have 2-4 years of experience in business programming, including design and implementation of manufacturing applications systems. Experience with minicomputers is also required.

You will work for the Manager of the EDP Technical Support section, which is part of the National EDP Services Department which coordinates and provides technical direction and support for all EDP consulting engagements. Travel of up to 25% will be required.

Starting salary will range from \$18,000 to \$22,000, depending on experience.

Please send resume and salary history in confidence to:

CW Box 4870
797 Washington Street
Newton, Massachusetts 02160

AIRLINE DATA PROCESSING OPPORTUNITIES

Texas International Airlines, a Houston based regional airline operating in 9 states and Mexico with annual revenues exceeding \$100,000,000 is seeking professional systems and programming personnel.

Successful candidates will have a degree in computer science, mathematics, or business administration. Openings exist at several levels within the organization. Significant work experience is preferred; however, for entry level positions, applicants with outstanding educational credentials will be considered.

Texas International offers an outstanding work environment, an exciting place to live, and a benefits package which only an airline can offer. Please submit resume and salary history in confidence to:

Personnel Department
TEXAS INTERNATIONAL
AIRLINES, INC.
P.O. Box 12788
Houston, Texas 77017

Programmer

DIRECTOR DATA PROCESSING SR. PROGRAMMER FIN'L APPLIC

Position is for aggressive, profit-minded, shirt-sleeve EDP supervisor. Experience in assembly programming is essential. Knowledge of statistics and finance is helpful. Salary open. Excellent profit sharing, other benefits. Send detailed resume to

Value Line Data Services
5 East 44th Street
New York 10017
Attn: T. Kane

MARKETING SYSTEMS ANALYST

Basic Timesharing, Inc., a leading California-based manufacturer of business computer systems, has a challenging career opportunity for a capable, marketing-oriented systems analyst.

Individual will provide technical support to BTI sales representatives in the Eastern Region, and will be based in Cherry Hill, New Jersey. Must have the ability to communicate effectively with customers. Position requires 3 or more years systems and programming experience, preferably with minicomputers and interactive BASIC. Applications experience with accounting, inventory, order processing, and administrative systems desirable.

We offer an attractive base salary, liberal company-paid benefits, plus profit-sharing. Call or write Sam Anson, Eastern Regional Sales Manager
Basic Timesharing, Inc., 3 Executive Campus, Cherry Hills, N.J. 08002 (609) 662-1122.

MANAGEMENT SYSTEMS POSITIONS

...with a world leader

DANIEL INTERNATIONAL CORPORATION, a world leader in heavy construction, seeks data processing professionals to fill the following positions. Due to our strong growth position, there are excellent promotional opportunities to even greater responsibility. Excellent starting salary, liberal relocation allowances, and benefit programs.

SYSTEMS ANALYST

Applications analysis and design on large scale IBM hardware. Develop major EDP systems and interface with all levels of management throughout company.

PROGRAMMER ANALYSTS

Analyze job requirements, prepare specifications, prepare time and costs estimates for systems development work. Will also function as a programmer. 2-3 years experience with large scale IBM systems.

PROGRAMMERS

1-2 years experience with large scale systems, design program logic, code programs, test and debug programs and prepare program documentation. COBOL experience desired.

If you have the above qualifications and would like to relocate to our Corporate Headquarters in Greenville, S.C., call NEIL WINSLOW (803) 298-2411 COLLECT for immediate consideration or send resume in confidence with salary requirements to:

NEIL WINSLOW

Daniel International

Daniel Building
Greenville, S.C. 29602
an equal opportunity employer



DANIEL
INTERNATIONAL CORPORATION

BURROUGHS PROGRAMMER

Outstanding opportunity for qualified computer programmer to work with banking applications.

Require one to two years experience with Burroughs medium system computer using COBOL language. Financial EDP experience also preferred.

Company located in western Michigan offers excellent benefits and opportunity for advancement. Salary commensurate with qualifications. Send resume to:

CW Box 4868
797 Washington St.
Newton, Mass. 02160
An Equal Opportunity Employer

SYSTEMS ANALYST PROGRAMMER

University computer center seeking systems analyst-programmer with working knowledge of: DOS-VS systems; CICS-VS; COBOL and BAL programming languages. Should have familiarity with problem analysis. Good verbal and written communication skills are essential. Background in designing and implementing on-line application systems desired. Bachelor's degree in Computer Technology or related field preferred.

Send resume including

Salary History to:

Walter Miner

Director of

Data Systems & Services
PURDUE UNIVERSITY
CALUMET CAMPUS
2233 171st St.

Hammond, IN 46323

*An Affirmative Action
Equal Opportunity Employer*

Municipal

Analyst/Programmer

Startup computer installation seeks a designer/implementor to computerize a variety of interlocking systems. Accounting, programming, and systems design experience required. Dynamic environment needs a hard working problem solver, communicator, educator and diplomat. Two years of business programming and design experience expected. Accounting degree and online/DBMS experience highly desired. Salary \$18-20K.

Consulting Systems Analyst

Technically creative self-starter needed for one-year assignment. Possibility of continuation may be earned. Initially will travel to NYS cities to analyze and document payroll/personnel applications. Subsequently will produce detailed specifications and develop local payroll/personnel system, etc. Require polished communications skills — including documentation design, and analyst-programmer expertise (3+ years). Salary \$18-20K.

Resumes with salary history by

February 4, 1977

Gerald F. Johnson

Director of Finance

City of New Rochelle

515 North Avenue

New Rochelle, N.Y. 10801

CNR is an AA/EO Employer

Detach here, moisten and seal envelope securely before mailing

Fold and insert order form (attached through binding) and remittance here.

USE THE ATTACHED
ORDER FORM AND
THIS ENVELOPE FOR:

- ☐ a new subscription
- ☐ new address
- ☐ new title
- ☐ new industry

Order form is attached through binding. Be sure to include current label or label information when making a change.

first class
permit no 40760
newton ma

BUSINESS REPLY MAIL no postage stamp necessary if mailed in the United States



COMPUTERWORLD

postage will be paid by

CIRCULATION DEPARTMENT

797 Washington Street
Newton MA 02160

position announcements

position announcements

position announcements

position announcements

position announcements

Information Systems Programmers

The Process Industries Group of Stone and Webster has openings in its New York offices for experienced programmers.

We seek degreed individuals, preferably with engineering experience and a knowledge of FORTRAN. You should also have two years experience in business applications involved with the design of data base systems.

The position involves programming in technical areas. Experience on large scale IBM 370/VS remote teleprocessing equipment, in addition to cost control application would also be helpful.

For consideration, please forward a complete resume with salary history and requirements to Employment Department, Dept. #128, Stone and Webster Process Industries Group, One Penn Plaza, New York, N.Y. 10001. Stone and Webster is an equal opportunity employer, m/f.



Finding the best is what we do best.

Our staff is expert at finding "the best person for the job." Most of our placement managers are C.P.A.'s, C.A.'s, controllers or systems managers, the largest most experienced financial, banking and data processing service in the world.

We have expanded to 50 offices throughout the United States, Canada and also Great Britain.

We believe the combined talent and skill of Robert Half employees made us what we are today.

Maybe we're just what you're looking for.



World's Largest Financial & EDP Personnel Specialists.

Call us.
We're in the White Pages
in key areas throughout the
United States,
Canada and Great Britain.

The Oakland County Merit System announces an open competitive examination for:

SYSTEMS ANALYST II

If you are one of these rare professionals, here is an opportunity worthy of your immediate consideration.

The COUNTY OF OAKLAND is seeking dedicated individuals to join our progressive staff of data processing professionals. You'll become involved in a wide variety of challenging assignments and applications.

Minimum qualifications: Bachelor's Degree and two years experience in programming and systems analysis; two years experience can be substituted for the A.A. Degree. The qualified applicant must be able to communicate effectively with user departments and possess a high proficiency in documenting and writing program specifications. A good working knowledge of COBOL, teleprocessing systems and data base management is preferred.

Salary (\$15,432 - \$18,040), currently under review, is commensurate with experience. Fringe benefits package includes fully paid hospitalization, a Dental plan, and the traditionally excellent government holiday, vacation, sick leave and retirement plans.

For additional information, contact:
The Personnel Department, 1200 N. Telegraph Rd., Pontiac, MI 48053. An Affirmative Action/Equal Opportunity Employer.

MIS Professionals

ICI United States Inc., a multi-division subsidiary of one of the world's largest chemical companies, is seeking candidates for two openings in the MIS Department of our suburban Wilmington, Delaware location.

SENIOR BUSINESS SYSTEMS ANALYST

The successful candidate should have 6-8 years of general business experience including computer systems development and implementation. This individual should also have excellent communication skills as well as demonstrated creativity. On-line order processing or pharmaceutical experience would be a plus. Degree preferred.

SENIOR PROGRAMMER ANALYST

The successful candidate should have 3 to 5 years of general business knowledge with experience in COBOL, OS, JCL, and IMS or CICS, as well as good communication skills. Knowledge of on-line order entry/inventory control would be a plus. Degree preferred.

These are career opportunities in an established growth-oriented company. We offer an excellent salary and benefits program, as well as paid relocation.

Please send resume along with salary history in complete confidence to:

Joan E. Efford



ICI United States Inc.
Wilmington, Delaware 19897
An Equal Opportunity Employer M/F

Systems Programmers

Digital seeks innovative programmers to design and implement operating systems and network/communication software at all levels of complexity. The individuals will be operating in an unstructured, positive atmosphere with extremely talented peers. Background in operating system, design and assembly language programming is required. A definite plus would be experience with RSTS/E, RSX-11M or related minicomputer systems. BSEE, BSCS, MSEE, MSCS, or equivalent with 1-10 years experience indicates the many levels of openings available within Digital's dynamic exploding state-of-the-art environment.

Software Product Manager (DECNET)

As software products manager (DECNET), you will be involved with the formulation of overall strategy for specific Digital network and communications products. One of your strong responsibilities will be defining and analyzing input from marketing groups and engineering groups to define requirements for products. Effective articulation and communications skills will help you develop and coordinate business plans for the total product manufacturing, marketing and sales including an on-going responsibility for profit enhancement. The successful individual will be aggressive without being overbearing, have a keen and analytical mind, strong computer knowledge with an applications and/or computer communications background, preferably in the large-scale computer area.

Forward resume outlining salary requirements and indicating position desired to Joe Hart, Digital Equipment Corporation, Dept. B117, 162 Main Street, Maynard, Mass. 01754.



an equal opportunity employer m/f

NCR's newest facility, the Data Processing Division in Wichita, offers growth opportunities for ambitious individuals to work on state-of-the-art, next generation, small business computer systems and associated equipment. Wichita's air is among the cleanest... school systems are among the finest in the country. We welcome an opportunity to discuss employment with you!

SENIOR DATA BASE MANAGEMENT ENGINEER

Minimum of 5 years experience in implementation of a data base management, operating or communications system. High degree of visibility within the organization reporting to the Advanced Development Manager.

SYSTEMS SOFTWARE PROGRAMMERS

- Communications • File Management
- Minicomputer Operating Systems
- Firmware Development • Diagnostic Systems Designers
- Compiler Designers • Assembly Level Programmers

SYSTEMS HARDWARE DESIGN

- Real-time Architectures and Development with experience with on-line minicomputer applications.
- Network Design and Communications Control for Distributed Processing Systems.
- Minicomputer Hardware/Software Design Trade-off.
- Terminal and Peripheral Interface Design.

NETWORK DESIGN

- Node Control • Distributed File Management
- Terminal Handling • Computer Communications

SEMICONDUCTOR COMPONENT ENGINEER

- 2 or more years experience with emphasis in:
- Evaluation and Specification of Semiconductor Components
- Discrete, Digital and Linear IC's

DESIGN AUTOMATION ENGINEER

- BSEE degree with minimum of 3 to 5 years experience.
- Familiar with Fortran, Logic Simulation, Systems Simulation, and P.C. Board Design.

COMMUNICATIONS SYSTEMS ENGINEERS

A degree in engineering, computer science or equivalent is required with preference being an advanced degree. An MBA would be a substantial asset. Applicant must have strong systems orientation and substantial experience with communication systems. In-depth knowledge in one or more of the following areas are desired:

- Operating System Provisions toward communication, including communication access methods.
- Communication processor architecture.
- Communication link disciplines.
- Communication systems diagnostics.

Send resume including salary history to: Max Anderson, Professional Placement, Dept. CN, 3718 N. Rock Road, Wichita, Kansas 67226.

An Equal Opportunity Employer



Data Processing Division — Wichita

position announcements

position announcements

position announcements

position announcements

position announcements

SR. PROGRAMMER / ANALYST

An important opening exists for a Sr. Programmer/Analyst in our EDP Department.

This position involves significant work on application development and user interface. New project development work is also included.

Two or more years of programmer/analyst experience required. Fortran and assembler languages BAL desirable.

For further information send resume or call:

Personnel Dept.

CF INDUSTRIES

Salem Lake Drive
Long Grove, IL 60047
(312) 438-9500 Ext. 212

An Equal Opportunity Employer

CF Industries, Inc.

SANDY JONES Speaks Your Language...

Sandy Jones has talked to the major corporations. She knows where the great EDP openings and EDP dollars are—for analysts, reps, programmers.

Now, Sandy Jones wants to talk to you. With 10 years in systems, Sandy Jones can speak your language. CALL: Ask for Sandy. (Or send resume in confidence)

(203) 838-4188

EDP Career Opportunities, Inc.

149 East Avenue
Norwalk, Ct. 06851
Affiliates in 8 major U.S. cities including Hawaii
(Fees 100% paid by company)

PROFESSIONALS ONLY

If you are a programmer programmer/analyst, systems analyst, or EDP professional and would like the most individualized job search offered in the data processing field today on a local or national level, forward your resume, with present salary and geographical preference, in strict confidence, to:

E.D.P. SEARCH, Inc.
P.O. Box 331
Hartford, Conn. 06105

OUTSTANDING OPPORTUNITIES

Two programmers needed to participate in extensive resystemization of a major business application and to provide systems and data research support in the area of Student Financial Assistance. One position offers significant design and technical responsibility. Both positions require a B.A. degree or its equivalent. 1-3 years experience for one position; the other 2-4 years experience of 360/370 OS programming experience in COBOL. Knowledge or experience in data base concepts/packages will be a plus. Salary in low to mid teens. Send resume to Personnel Office, Department of Higher Education, 225 W. State St., Trenton, NJ 08625 by Jan. 24, 1977.

INFORMATION SYSTEMS TRAINER

Analyze requirements, design, teach, coordinate and evaluate technical DP training courses for State and Local government personnel. Must have: training experience, DP experience—minimum four years within the last six, COBOL programming (2 yrs.), business systems (2 yrs.), well-developed written and oral communication skills. Degree preferred. Salary range \$15,000 to \$19,000.

Send resume by February 7, 1977 to P. Morgan, State of Oregon, DSD-ISTS, 240 Cottage St., SE, Salem, Oregon 97310
an Equal Opportunity Employer

COMPUTER TECHNOLOGY FACULTY POSITION

The Purdue University School of Engineering and Technology at Indianapolis is seeking candidates to fill a position in the Computer Technology Department at the Assistant Professor level beginning August, 1977. M.S. degree and five years of relevant teaching and industrial experience required. Ph.D. desirable. Position responsibilities include full-time teaching in Associate of Applied Science and Bachelor of Science curricula. General systems experience is preferred. Some expertise in mini-computers/microcomputers would be helpful.

Applications must be received by March 15, 1977. Send to:

Dr. Robert G. Crozier
Purdue University School of Engineering and Technology
Indiana Univ.—Purdue Univ.
at Indianapolis
1201 East 38th Street
Indianapolis, Indiana 46205

Data Base Coordinator

Coordinator has technical responsibility for completion of design, implementation and maintenance of an integrated data base information system under ADABAS and CICS using OS/VS1 on an IBM 370/145. Applicants must have B.A. or B.S. degree and significant recent experience with COBOL, data base systems including CICS and preferably ADABAS. Hardware environment: remote Data 100 terminal and CRT terminals to central dual IBM 370/145's.

Salary to \$20,000 depending on qualifications and experience. Send letter of application, resume including salary history, college transcripts and three letters of reference by February 15, 1977, to: Robert D. O'Dell, Computer Services, Box 15, Metropolitan State College, 1006 11th St., Denver, Colo. 80204.
Metropolitan State College is an Equal Opportunity Employer.

CHALLENGE: YES!



white to move and mate in 3 (Problem No. 5)

YES! We are looking for talented and dedicated programmers who like to tackle challenges.

ALLEN SERVICES CORPORATION is the MOST successful international organization of its type anywhere today. We are in the CUSTOM PROGRAMMING BUSINESS—we create individually tailored software for many of the largest corporations in the world.

Our business is expanding rapidly, we need good, solid, skilled programmers.

Whatever your area of expertise—whether it ranges from IBM or Datapoint to Burroughs or NCR from COBOL or PL/1 to ASSEMBLER, from IMS or TOTAL to MARK IV or CICS—if you're a computer programmer or analyst who likes challenges and is good at problem solving, we have a place for you. Give us a call and talk with us about the possibility of joining our congenial group of systems and application software technicians. We have immediate openings for many qualified people. Compensation is excellent and we are of course, an Equal Opportunity Employer M/F.

Phone toll free or write
(800) 543-7583

OHIO ONLY
(Collect) 513-890-1200

ALLEN SERVICES CORP.

212 W. NATIONAL RD.
VANDALIA, OHIO 45377

P.S. We will be happy to supply the solution to the above problem on request.

QC Engineer Data Communications

We're looking for an innovative problem-solver; a degreed engineer with broad experience in data communications and network design including familiarity with current telecommunications hardware and software; mini and microcomputer controller systems, Bell telecom equipment, interface requirements such as protocol and synchronous/bisynchronous transmission schemes; and data network design with emphasis on maintainability and reliability.

Your duties will include analysis, identification and solution development for repetitive network problems; the implementation of preventative maintenance programs; and the development of design changes and new designs to improve reliability and operability of our data communication network. Some travel is required, particularly in the initial stages of your work.

We offer a very competitive salary, excellent benefits, and the technological challenge and growth potential of an international computer services growth company. Please send your resume, including recent salary history to:

Mr. Brian La Barre
COMMUNICATIONS MANAGER
COMSHARE, INC.

COMSI-ARE

P.O. Box 1588
Ann Arbor, Michigan 48106
An Equal Opportunity Employer

District Manager

Field Engineering

The Data Communications Division of Harris Corporation, is one of the country's largest suppliers of remote batch computer terminals and distributed data processing systems. We are currently seeking a Field Engineering District Manager who will be based in San Mateo, CA., with responsibility for service of our products in California, Oregon and Washington.

The successful candidate should have 3-5 years management experience in the maintenance of digital electronic equipment, minicomputers and/or data communications equipment. Will have P&L responsibilities.

We offer excellent starting salary, numerous benefits and continuous opportunities for career advancement.

For prompt consideration, please call COLLECT:

Joseph R. Lo Curto at: (213) 477-8291
or send resume including salary history and requirements to him at:

HARRIS COMMUNICATIONS AND INFORMATION HANDLING

HARRIS CORPORATION Data Communications Division
10960 Wilshire Boulevard Suite 414
Los Angeles, CA. 90024
an equal opportunity employer m/f

Senior Programmer Analysts

Avco Computer Services, one of the largest and fastest growing data centers in the East, is seeking Senior Programmer Analysts.

Working as members of our Management Systems Development staff, these individuals will be challenged by a variety of assignments in commercial applications development and implementation.

The environment includes an IBM 360/75 and a 370/158, operating under OS/MVT/HASP.

The successful candidates must have several years experience in programming with a good working knowledge of ANS COBOL and at least one other programming language. Exposure to commercial software packages and data base or file management systems is desirable. A Bachelor's degree is required.

Kindly send your resume including salary requirements to: Mr. Peter Dowd, Employment Supervisor.

AVCO COMPUTER SERVICES

201 Lowell St.
Wilmington, Mass. 01887

An Equal Opportunity Employer

AVCO CORPORATION

position announcements

position announcements

position announcements

position announcements

position announcements

AIRLINE PROGRAMMERS

Quantum Information Resources, Canada's leading software development organization, is currently involved in the development of state-of-the-art PARS based systems. Urgent requirements exist for data processing professionals in the following areas.

PROJECT MANAGER thoroughly versed in leading project teams charged with the implementation of financial applications in a PARS environment. Knowledge of PL1 and BAL.

COMMUNICATIONS PROGRAMMERS with a minimum of five years in COLLINS message switch systems acting as front ends to airline reservations systems.

Remuneration is excellent, and opportunity exists for challenging career development in Canada, the U.S., and abroad. Interviews will be arranged in a location convenient to you in the near future. Please forward details of experience and telephone numbers for contact to:

QUANTUM INFORMATION RESOURCES LTD.
Suite 2080
Place du Canada
Montreal, Quebec, Canada

YOUR COMPUTER CAN'T
FIND THE JOB FOR YOU.
OURS CAN.

National
Personnel
Associates®

175 Professional Firms
in 130 Metro Areas

D. BROWN & ASSOCIATES

Data Processing Division
610 S.W. Alder, Suite 711
Portland, Oregon 97205
(503) 224-6860

AVAILABILITY, INC.

Data Services Consultants
1300 N. Westshore Blvd.
Tampa, Fla. 33607
(813) 872-2631

Specialists in the placement of
EDP Professionals.

PROGRAMMER ANALYST

Life Support Equipment Corp. has open a position for an "Applications Programmer." This is an excellent opportunity to participate in the development and installation of administrative, financial, and MRP systems in a fast growing manufacturing environment.

Required experience must include minimum of three years writing basic, some college, and a proven track record in the design of business systems. In addition, the ideal candidate will have had exposure to data base management, RDOS, and Data General computer equipment.

Send resume in confidence to Mr. David Provost, Life Support Equipment Corp., 6 Gill St., Woburn, MA. 01801.

MID WEST OPPORTUNITIES

Programmers-EDP Auditors
Data Base Admin.
\$14 to \$25K

Our major clients now have career openings in all phases of DP. Send resume to

Jim Green

The Executive Suite
Box 12083

Okla. City, Ok. 73112

We invite applications for CO-ORDINATOR OF EDUCATIONAL COMPUTER SERVICES involving coordination of academic computer usage, writing user manuals, organizing seminars, and consulting with faculty. All qualified candidates will be considered with preference to Masters degrees in Computer Science and experience on the Burroughs 6700 system. Yearly salary is \$13,000 to \$16,000 depending upon qualifications.

Send vitae and five reference names to: Dr. R.W. Pulleyblank, Search Committee, A.V.P. Office, University of the Pacific, Stockton, CA 95211. The University is an equal opportunity/affirmative action employer. Deadline, February 15, 1977.

PROGRAMMER SOFTWARE SUPPORT

Addition to staff has created a challenging position in our System Support team. Experience in the internal code and control of OS/MVT, IMS, VM, UCC/20, TSO or DOS would help an individual in learning this job.

This position is at our corporate offices in Minneapolis. Starting salary based on applicable experience. Excellent fringe benefits including air travel. Send detailed resume or call (612) 726-7668.

NORTH CENTRAL AIRLINES, INC.
Employment Office
7500 Northliner Drive
Minneapolis, MN 55450
an equal opportunity employer

PROGRAMMER ANALYST

Requires degree in Chemical Engineering, Chemistry, Math or Statistics with experience in process simulation, mathematical modeling and statistical applications. The person we seek will have at least 3 years of industrial Fortran programming experience and a strong ability to communicate and get along with others. Salary commensurate with experience.

Interested applicants should send resume including salary history and requirements to:

OCCIDENTAL
RESEARCH CORP.

P.O. Box 310, Dept. 7
La Verne, Calif. 91750
Equal opportunity employer

Data Processing

Advance Your Career at Bendix

Bendix has challenging support opportunities for

Project Systems Analysts

and

Senior Programmers

to support the design, development, and testing of mini-computer command systems and real-time telemetry processing simulation systems Xerox SIGMA & Deck PDT-11 systems data reduction and analysis software.

For immediate discussion of career opportunities, call or write:

Mr. Larry van der Veen
155-B Moffett Park Drive
Sunnyvale, CA 94086
(408) 734-5800

BENDIX **ADVANCED DATA SYSTEMS**

An equal opportunity employer

Data Processing at Amtrak!

Amtrak's programs require the development of new systems to support FINANCIAL, OPERATIONAL, ENGINEERING, and RESERVATION functions of a nationwide corporation. We are adding senior and mid-level personnel who qualify for the following:

Real Time Communications Programmers

Requires on-line experience for systems development in Assembler language, maintenance, program testing, and the installation of CDC and PDP equipment.

Programmer & Programmer/Analyst

Requires extensive experience in the design and implementation of applications in an IBM OS/MVT or VS environment using MARK IV, COBOL, FORTRAN, TSO, IMS, IBM 3790 programming helpful.

Operations Production Technical Support

Requires 1-2 years experience in coding and debugging IBM 360/370 OS JCL, analysis and resolution of production abends, OS utilities, operations documentation review and turnover. Knowledge of MVS, TSO and hands-on computer operations helpful.

Systems Programmer

Requires experience in such areas as: MVS, JES II, TSO/TCAM, VTAM/NCP, VSAM, IMS, and multiple languages, including ALC, COBOL, FORTRAN OR MARK IV. Must possess ability to provide fast problem resolution, analyze and interpret performance data, recommend and develop standards.

We offer excellent salaries, benefits, and growth opportunities. Send resume including salary history in strict confidence to:

Amtrak J.R. Brune, Personnel
AMTRAK
955 L'Enfant Plaza SW
Washington, D.C. 20024

An Equal Opportunity Employer M/F

SOFTWARE DEVELOPMENT PROFESSIONALS

Do You Want to Contribute To
New Advanced Systems?
If So . . .

We are the leading independent supplier of data entry and communications systems in the industry, and have immediate career opportunities for software specialists to actively participate in the development of major new products.

We have opened a new software development facility in West Caldwell, New Jersey, and invite you to contact us if you desire to work in a challenging and creative advanced systems environment, and have micro/mini computer Assembler Language expertise in:

- Operating Systems
- Language Processors
- Data Communications

For immediate confidential consideration,
please send resume including present salary to:

MR. DAN McCONNELL
Director of Personnel

Mohawk Data Sciences

1599 Littleton Road
Parsippany, New Jersey 07054
An Equal Opportunity Employer M/F

MD S

SENIOR SYSTEMS DESIGNER

Engineering Design Data Base

This is an opportunity to join in the design and launch of an advanced, on-line bill-of-material system for product assumption and pre-release design information control. This multi-terminal system must interact with engineering, manufacturing and purchasing activities to capture and disseminate component, assembly and vehicle specification changes, and to aid in part usage codification.

This position requires an individual with recent design responsibility for such a system, and at least a B.S. degree. Working knowledge of data base techniques, terminal/data communication software, and distributed processing is required. Experience with several languages, large-scale and minicomputer implementations, and top-down design techniques is desirable.

Job responsibilities include the analysis of procedures and product codification methods, systems development, design and specification of computer and software requirements, and supervision of programmers. The job also requires project management, implementation control and user training until the new system has complete acceptance by the various activities.

Please send resume and salary requirements to:



CAR PRODUCT
DEVELOPMENT GROUP

Attn: Mr. J.B. Shaw
Salaried Personnel
P.O. Box 2053
Dearborn, Michigan 48121
An Equal Opportunity Employer

position announcements

position announcements

position announcements

position announcements

position announcements

SOUTHERN CALIFORNIA

SR. MANUFACTURING SYSTEMS ANALYST

Amorlite, Inc., a leading manufacturer of hard resin ophthalmic lenses located in San Diego County has an immediate job opportunity for a Data Processing Professional. This individual must have a minimum of 4 years experience in systems design and analysis in a manufacturing environment or equivalent. Some experience in development of MRP helpful.

Knowledge of on-line and communications oriented systems helpful. Mini-Computer, RSTSE operating system experience will be considered a definite plus. College degree preferred.

We offer excellent salary and fringe benefits package. Submit resume with salary history in confidence to:

ARMORLITE, INC.

Personnel Department
P.O. Box 1000
San Marcos, CA 92069

ANALYSTS and PROGRAMMERS

Boston University is seeking several experienced professionals for permanent assignments — some at the project management level — in its Administrative Data Processing Department.

We are currently maintaining a wide spectrum of systems and are also involved with a multi-year development program for new systems.

Previous experience with any of the following applicational areas is required:

- Student Registration
- Financial/Accounting
- Admissions - Financial Aid - Housing
- Payroll - Personnel - Budget
- Alumni and Development

Under an OS/VS 1 environment, we currently use a 370-145, to be replaced this year with a 370-148.

We are using and committed to structured programming in Cobol, IMS-VS, and Mark IV; experience in these is a definite plus.

Salary structures are competitive and commensurate with experience and ability.

Please forward resume, in confidence, to the
Personnel Department
881 Commonwealth Avenue
Boston, MA 02215

BOSTON UNIVERSITY

An Equal Opportunity/Affirmative Action Employer

TECHNICAL SUPPORT SPECIALIST With S&L Processor

New position just opened for the data systems support "Pro".

To qualify, you must be able to provide: Hardware/software technical support in real-time, on-line communications oriented systems. "Hands-on" experience with minicomputers, integration of hardware and equipment operations. Designing, evaluation, implementation and maintenance of data communications software, evaluation, selection and installation of computer hardware.

If you want to be considered for this position, send your resume, with background, and salary history, in confidence to:

Al Jordan MATERIAL SERVICE CORP.

300 W. Washington St.
Chicago, Illinois 60606

an equal opportunity employer m f

CONSOLIDATED COMPUTER INTERNATIONAL INC.

Consolidated Computer has openings for EDP professionals to sell, support, and service the KEY-EDIT family of data entry systems.

SALES REPRESENTATIVES
SYSTEMS ANALYSTS
PROGRAMMERS
FIELD SERVICE ENGINEERS

Openings Exist In:

Boston
New York City
Philadelphia
Washington, D.C.
Atlanta
Detroit

Chicago
Dallas
San Francisco
Minneapolis
St. Louis

We offer challenge, excellent salaries and benefits, and a tremendous opportunity for advancement.

Send your resume to:

Personnel Department
Consolidated Computer
275 Wyman Street
Waltham, Mass. 02154

An Equal Opportunity Employer

COMPUTER NETWORK DIREC.

The W. Va. Network for Educational Telecomputing is seeking a director responsible for the overall management of the computer network and operation of the host site. The network consists of 15 state supported colleges and universities. The host site operates IBM 360/75 and 370/145 systems and provides remote services to a network comprised of DEC PDP11/40's. Applicants should possess solid management experience with large scale computer system and telecommunications, as well as education/experience in computer science.

Salary: \$25,000-\$30,000
Position Available: July 1, 1977
Application Deadline: March 1, 1977

Send Resumes to: Dr. M. Douglas Call, W. Va. Board of Regents, 950 Kanawha Boulevard East, Charleston, West Virginia 25301
EQUAL OPPORTUNITY, AFFIRMATIVE ACTION EMPLOYER

READ THIS

We specialize in the placement of computer professionals. Our counselors have experience in your field. We can offer suggestions & career development.

Is Your Strength...
SALES (MGMT)?
ENGINEERING?
MANUFACTURING?

Our clients are America's prestigious companies. Compensation pkgs & career progression. FEE PAID.

CALL or WRITE

F-O-R-T-U-N-E

393 Front St.
Hempstead, N.Y. 11550
(516) 485-5600
Company Inquiries Welcome

Florida

Bank DP Positions

VP Reg. Operations	to \$35K
DP Mgr	to \$32K
Mgr. System & Prog	to \$30K
Mgr. Tech. Support	to \$24K
Proj. Leaders	to \$23K
Sr. Sys. Analysts	to \$21K
Sr. Programmers	to \$18K

Contact: J.H. Temples



The
PMS
Group

Executive Recruitment Division

3900 N.W. 79th Avenue
Suite 451, Miami, Fla. 33166
Phone (305) 592-3610

FACULTY POSITION

excellent opportunity in expanding program in Management Computer Systems. Teach courses emphasizing computer use in business. Past teaching and business experience desirable. Interest in applied research and community service required. Assistant Professor with doctorate, Instructor with ABD. Send resume and salary requirements to: R.E. Jacobson, Chairperson, Department of Management; University of Wisconsin-Whitewater; Whitewater, WI 53190. UW-Whitewater is an equal opportunity/affirmative action employer.

MANAGERS, SYSTEMS

PROGRAMMING TO \$28,000
IBM 370/158, requires SVS, a degree and management experience. Large data center with high visibility.

IBM 370/158, requires VS1 and management experience. Degree not required. CICS desired. Supervise staff of 8 professionals.

Several opportunities for systems programmers with heavy systems development experience on any of the following: PDP10, PDP11, 370 VS1-SVS, UNIVAC 1108 or H6000. To \$28,000.

The following are a few of the many additional positions currently available:

Process Control	to \$30,000
Mgr Systems Ana	to \$23,000
Jr. Systems Engineer	to \$22,000
Systems Analysts	to \$21,000
Cobol Progs. (35)	to \$19,000
Operations Mgr	to \$18,000

All fees paid by client companies. Forward your resume in confidence to:



**PERSONNEL
CONSULTANTS
INC.**

215 Gateway Towers
Pittsburgh, PA 15222

PROGRAMMERS AND ANALYSTS

Free Employment Service Northeast, Southeast & Midwest U.S.

Scientific and commercial applications • Software development and systems programming • Telecommunications • Control systems • Computer engineering • Computer marketing and support
Call or send resume or rough notes of objectives, salary, location restrictions, education and experience (including computers, models, operating systems and languages) to either one of our locations. Our client companies pay all of our fees.

RSVP SERVICES, Dept. C
Suite 700, One Cherry Hill Mall
Cherry Hill, New Jersey 08002
(609) 667-4488

RSVP SERVICES, Dept. C
Suite 300, Dublin Hall
1777 Walton Road
Blue Bell, Penna. 19422
(215) 629-0595

RSVP SERVICES

Employment Agency for Computer Professionals

EXPERIENCED FORTRAN PROGRAMMER

SPSS, Inc. is a small corporation with eight years of success specializing in the creation and distribution of software for statistical analysis. The SPSS Batch System is the most heavily used and widely distributed statistical package in the world, with over 1200 installations. We currently have two openings at the \$15,000 to \$21,000 level for experienced FORTRAN programmers to work on our implementation teams for our established batch system and our soon-to-be-released conversational system. Each job involves working with a team of two or three others on both maintenance and development activities.

Significant experience in the development and maintenance of large FORTRAN programs is a requirement, as is the ability to communicate effectively both verbally and in writing. Desirable qualifications include specific experience under IBM's OS or DEC's TOPS-20 operating systems, experience in the use of the SPSS system, and familiarity with statistics.

Our convenient downtown Chicago location offers our employees the flexibility of commuting from virtually any part of the metropolitan area.

These openings exist now. Send your resume and salary requirements immediately to:

C. Hadlai Hull
SPSS, Inc.
Suite 1234

111 East Wacker Drive
Chicago, IL 60601

SPSS, Inc. is an equal opportunity employer

DATA PROCESSING CAREERS

Policy Management Systems, a major division of Seibels, Bruce and Company, is the industry leader in computerized property and liability insurance software systems. Our history of solid growth has created career opportunities for the following additions to our customer support team:

CUSTOMER SERVICE REPRESENTATIVES INSTRUCTORS, TECHNICAL WRITERS PROGRAMMER ANALYSTS

CUSTOMERS SERVICE REPRESENTATIVES are needed to work with customer personnel in coordinating installation of our computer software systems in insurance companies throughout the U.S. and Canada. Individuals with customer service, data processing, and property and liability insurance experience will ideally qualify.

INSTRUCTORS are needed to conduct both customer and in-house training in data processing concepts, computer languages (COBOL, ALC & RPGII) and in the basics of our insurance software system products. The ideal candidate will be technically qualified and an effective speaker adept at explaining technical topics in a non-technical fashion.

TECHNICAL WRITERS are needed to prepare professional, high quality texts which accurately and adequately document systems and programs for customer use. The ideal candidate will be able to understand program source code, and have a flair for producing effective user manuals.

PROGRAMMER ANALYSTS applicants should have three or more years programming experience in either COBOL, ALC or RPGII, preferably on IBM 370. Teleprocessing experience is also desirable. Write only in strictest confidence outlining education, experience, salary, history, and area of primary interest to:

MR. WES DANIELS
POLICY MANAGEMENT SYSTEMS
P.O. Box 1
COLUMBIA, S.C. 29202

SOFTWARE SYSTEMS ANALYST

(Market Product & Systems Evaluation)

This corporate level staff position offers latitude for individual expression and opportunity for visibility to facilitate your career path as a result of interfacing with domestic and international divisions of Marketing, Design Engineering and Product Software Development.

To qualify, candidates will normally possess an applicable degree plus experience in operational software or application software as a Programmer, Systems Analyst, or Design Engineer; preferably knowledge of DOS-VS-OS-Communications-MIS and data base; analytical, evaluative and interpretive skills; ability to reduce technical matter to decision-making form and communicate effectively; and the capability to practice EDP skills individually, as a team member, or project leader.

You will play an important role with a highly motivated professional group.

Respond now in confidence — include salary history.



Mr. Vernon L. Mirre
Corporate Executive &
Professional Recruitment
NCR Corporation
Dayton, Ohio 45479

An Equal Opportunity Employer

position announcements

PROGRAMMING MANAGER

Major financial services company needs a programming manager. Heavy teleprocessing experience required with project management ability. Minimum two years in programming supervisor or lead position and a strong innovative systems background. Degree required with MBA/MS a plus. Send resume and salary requirements to:

Director of Personnel
P.O. Box 935
Royal Oak, Michigan 48068

SENIOR SYSTEMS PROGRAMMER

Ball State University has an opening for a Senior Systems Programmer to implement, document, modify and maintain software packages from vendors. Work with faculty, research, and administrative personnel in a user services capacity while helping to maintain the DEC system 10 software. BS in Computer Science or related with 2 years experience with TOPS-10 desired. Basic knowledge of IBM operating systems helpful. Starting salary to \$16,000. Excellent fringe benefits. 24 days paid vacation, educational opportunities. Deadline date for accepting resumes Feb. 7, 1977. Send resume to Personnel Services Office, Ball State University, Muncie, IN 47306. An Equal Opportunity/Affirmative Action Employer.

DATA PROCESSING MANAGER

Here's a solid career opportunity for someone with 3 to 5 years data processing and supervisory experience looking for a take charge position with our small but sure to grow EDP Installation. If you have experience with NCR equipment and/or have banking background particularly with NCR/CIF applications all the better. You'll find our wages, benefits and working atmosphere very attractive. All replies held in strict confidence. Send resume and current earnings to:

Personnel Department
The Manchester Bank
1100 Elm St.
Manchester, N.H. 03105
Equal Opportunity Employer

CENTRAL WISCONSIN

Sixth largest Medical Clinic in U.S. has opportunity for a programmer/analyst. Location offers exceptional living environment. Excellent benefits include three weeks vacation. Degree required, Computer Science or Math preferred. Person selected will be a highly productive, team oriented professional with heavy experience in several of the following areas; structured programming, COBOL, on-line systems, database, communications, health care applications, Burroughs medium systems. Send resume with salary history to Assistant Director of Employee Services, Marshfield Clinic, 1000 North Oak, Marshfield, WI 54449. An Equal Opportunity Employer.

position announcements

position announcements

position announcements

position announcements

Software Development Professionals

Get to know INTERDATA at the ACM Conference in Atlanta

As a computer professional you are aware of our reputation for excellence and phenomenal growth. In Atlanta, we'd like to get to know you — the top talent in our industry. Managers of our Software Development Group will be there to describe the exceptional opportunities available to those who qualify for our highly professional team which is involved in designing the next generation of INTERDATA's software. According to your level of expertise in Software Development including Operating Systems, utilities, data communications, networks, languages, diagnostics, etc. you will lead or become a member of our professional team.

Introduce yourself to INTERDATA by visiting our Hospitality Suite at the HYATT REGENCY Atlanta in Peachtree Center and ask for Bill Beattie, or call him on our Employment Hotline — (404) 575-1760 during the Conference, any day, any hour!!

If you can't make it or call, send your resume in strictest confidence.

INTERDATA

Subsidiary of PERKIN-ELMER

106 Apple St., Tinton Falls, New Jersey 07724

An Equal Opportunity Employer M/F

PROGRAMMER ANALYSTS TO \$18,000 - Southeast

Fortune 500 mfg corp in desirable SE location is currently searching for several prog/analysts for mfg, business & mktg applications in an on-line environment. Opptys require min 2 yrs IBM/360/370/ASSEMBLER programming exp. All fees paid. Excellent continued growth. Contact J. Schwab at (704) 527-4980 or send resume in conf to:

FOX-MORRIS
Personnel Consultants
4000 Park Road
Charlotte, NC 28209

Systems/Analyst

Local client seeking Financial Applications Analysts for IBM 370-135 DOS shop. Degree preferred. Knowledge of Data Base a plus. Salary to 18K. FEE PAID
Call Larry Weathers for confidential interview.

ROBERT HALF PERSONNEL AGENCIES
680 South 4th Street
Louisville, Kentucky 40202

The City of Flint, Michigan is recruiting for a Data Base Administrator, salary \$17,299-\$21,442. Appointment may be made at other than beginning rate. Requires education equivalent to Bachelor's Degree in Computer Science, Business Administration, Math or related field and at least 5 years experience in systems design and analysis, programming and operations with at least 3 years of the 5 years in a position of Administrative responsibility in a data processing installation using a Data Base Management System. Experience in the use of Cincom Systems, Inc. "TOTAL" is preferred. Additional experience may be substituted year for year for each year of required college.

Applicants should apply, City of Flint, Personnel Office, City Hall, 1101 S. Saginaw St., Flint, Michigan 48502, Attention: Myra L. Fry.

Systems Opportunities

The International Division of our expanding Pharmaceutical and Health Products corporation is presently seeking several capable Systems Professionals who can demonstrate their versatility and effectiveness in working with users to solve their problems through the application of information processing technology. All candidates must have experience in a large 360/370 OS COBOL environment and be able to communicate their ideas clearly, both verbally and in writing. A degree is required for each of these positions, and experience with IMS DB/DC would be very helpful. The positions currently available include:

Project Leader-Consumer Products

All positions require a minimum of 2-5 years experience and accomplishment in the Systems Design and Implementation area. It is also essential that applicants have a desire to accept responsibility and can demonstrate qualities of leadership.

Compensation includes good salaries commensurate with relevant education, experience and achievements, plus comprehensive employee paid benefits, including relocation to our headquarters facility situated close to New York City.

Sr. Programmer Analysts (3)

Interested qualified persons are requested to call 201-931-2367 collect or send detailed resume in strict confidence, indicating present and desired salary information and specifying position desired to: L.J. Timpone, Personnel Manager, Schering-Plough Corporation, Galloping Hill Road, Kenilworth, N.J. 07033.

SCHERING-PLOUGH CORPORATION

WE ARE AN EQUAL OPPORTUNITY EMPLOYER M/F

NEW JSY OPPTYS!

In our 18th year, we now represent top financial & industrial cos in NJ. Openings are for jr/sr programmers & systems exper. Rush resume to S. Devaney, & state present income & requirements or call. Our widely accepted resume outline is avail for the asking. All fees pd.

JP don HOWARD Personnel Inc

100 Menlo Pk., Edison, NJ 08817 • 201-494-3410
NYC • NJ • Chicago • Atlanta • S.F. • Dallas

NATIONS HEADQUARTERS FOR EDP/SYSTEMS PERSONNEL

New Hampshire Beckons**PRO-GRAMMER ANALYST**

The PEERLESS Insurance Company, in beautiful Keene, New Hampshire, needs PROGRAMMER/ANALYSTS with varying degrees of experience.

TWO OR MORE YEARS EXPERIENCE in auto insurance applications. BAL is a plus, but we will consider COBOL experienced people to train for BAL on 3rd generation equipment.

NO INSURANCE APPLICATION experience required, but 2 to 3 years BAL 3rd generation equipment experience is a must

Many opportunities open.

Keene is one of New Hampshire's nicest communities. New Hampshire has NO state sales or income taxes. If you want to work and recreate in a rural setting that's close to metropolitan areas, send full resume in complete confidence to:

Michael Cabot
Peerless Insurance Co.
62 Maple Avenue
Keene, N.H. 03431

— or call — 1 (800) 258-5303

An Equal Opportunity Employer M/F

PROGRAMMER ANALYST

Nationally recognized consumer products company offers a challenging opportunity for a qualified male or female Programmer Analyst with a minimum of 1 to 3 years solid IBM 360-65 or 370-155, COBOL background, and the interest and ability to broaden professional application experience. Prefer college degree, strong motivation and ability to assume project responsibility. We offer an excellent salary and outstanding benefits including profit sharing. Please send resume, including salary history to:

CW Box 4876
797 Washington St.
Newton, Mass. 02160
Equal Opportunity Employer M/F

Software Sales Person:

N.Y./No. East/Midwest. Dynamic; self-motivated; work independently. Top line system software. Sal. + comm. DataCorp, Inc.

CW Box 4871
797 Washington St.
Newton, Mass. 02160

PROGRAMMER/ANALYSTS**The Gap is GROWING**

Grow with us . . . professionally

We can offer you:

- a dynamic and expanding national retail chain
- an attractive Bay Area location
- creative systems environment
- IBM 370/145 with TOTAL DBMS
- On-line and distributed processing applications

If you can offer us:

- enthusiasm and self-motivation
- strong user orientation
- three to five years of business systems experience
- COBOL programming
- undergraduate degree

If you have the above qualifications and are interested in the challenge of developing and implementing an integrated management information system, we are interested in having you join our team of professionals.

We offer excellent benefits, competitive salaries and exceptional growth potential. Please submit resume and salary history to:



The Gap Stores, Inc.
875 Mahler Road
Burlingame, Calif. 94010
An E.O.E.

position announcements

position announcements

position announcements

position announcements

position announcements

EDP/MIS CONSULTING

We are a leading international CPA firm with a well established and accepted management consulting practice. We are continuing to expand at a rapid pace, and as a result have entry level and senior consultant position openings in many of our U.S. offices for EDP/MIS specialists.

Our clients include business, financial, manufacturing, health care and governmental organizations. Typical projects include:

- Development and implementation of financial and operational information, records and support systems.
- Performance evaluations and hardware/software feasibility studies.
- Data systems security and internal control reviews.
- Long range planning using simulation and other techniques.

Because of our size and number of offices, most of our consultants average less than twenty per cent travel.

Candidates must possess a high degree of initiative, drive and professional capacity — we are looking for "partner potential". A history of prior successes must be demonstrated by academic achievement and an increasing responsibility/leadership role over 2-6 years in one or more of the above project areas.

We offer a starting salary commensurate with ability, education and experience, and an environment in which you will directly influence your future advancement rate. If this appeals to you, send resume and salary history in strictest confidence to:

CW Box 4872
797 Washington St.
Newton, Mass. 02160
an equal opportunity employer m/f

DP MANAGER

Immediate opening for manager of IBM Systems/3 Model 15. Variety of applications for both in-house and outside clients. Past Systems/3 and managerial experience a must. Room for growth. Many benefits. Salary up to \$20M. Apply immediately to:

Personnel Manager
Liberty Petroleum Co., Inc.
Dept. "M"
P.O. Box 1209
Mt. Vernon, IL 62864

TECHNICAL SPECIALIST

N. England mfr seeks degreed indiv with exp in: systems architecture network design, terminals, mini & micro processors & their relation to IBM mainframes. Salary to \$30,000. Contact Stan Durbas

ROBERT HALF PERSONNEL AGENCIES
111 Pearl Street
Hartford, Conn. 06103
(203) 278-7170

PROGRAMMER/ANALYST BOISE, IDAHO

The City of Boise, Idaho is developing an advanced on-line municipal information system, the first on MODCOMP IV minicomputers. We require an experienced programmer/analyst (3 years +) to develop on-line systems in finance and administration. FORTRAN experience is essential. Transactional processing, data bases, real time operating systems and business systems experience is highly desirable. Salary/Negotiable. Send resume detailing work and salary history to Boise City Personnel Department, P.O. Box 500, Boise, ID 83701.

An Equal Opportunity Employer M/F

WANTED:

Hardware/software experts to help build new computers to match the world's best software.

Telefile Computer Products, Inc., the only supplier of new peripherals and main memory for Xerox computer users, is embarking on a new challenge.

The development of two new Sigma computers. They will extend the line's capabilities well into the 1980's and take full advantage of Xerox' state of the-art CP V and CP R operating systems — software that the latest Datapro Research survey* shows as ranking first in the world.

Sigma 9 computer

- Will be micro-programmed
- Schottky MSI circuitry
- Prototype completion 12 '77
- Full production by 12 '78

Sigma 11 computer

- 4 X faster than present Σ9
- One-half the price
- ECL logic
- Full production by 12 '79

All standard Telefile and Xerox I/O processors, main memory, and peripherals will be plug compatible with both machines.

Telefile, located in the heart of California's sun filled, dynamic Orange Coast, is staffing up now and needs these highly skilled professionals to help

- CP V and CP R Development Programmers
- Programmers (All Languages)
- CP V and CP R Analysts
- Firmware Designers
- Comp. Architecture Designers
- Semi and Core Memory Designers
- ECL Logic Designers

Only highly qualified applicants need apply for this exciting new venture with a computer company that has shown an average annual growth of over 50% five years in a row. Send resume and salary history to:

Mr. S. V. Edens, President
Telefile Computer Products, Inc.
17131 Daimler Street, Irvine, CA 92714

Telefile

An Equal Opportunity Employer M/F
*Computerworld, December 6, 1976

Telefile
does it
again.

MANAGER SYSTEMS PROGRAMMING

Rand Corporation, a leader in research applied to national problems, seeks a senior systems manager to assume management of all facets of control system design and implementation for the corporation's computing facility. Responsibilities include technical leadership of 10 system programmers supporting a MVT/HASP based 370/158 migrating to MVS, a PDP11/70-11/45 facility utilizing UNIX, a node on the ARPA network, and a WYLBUR online and RJE system. Currently planned are the installation of an AP and TSO.

Qualified candidates will possess a degree in Computer Science or related field and extensive experience in all aspects of control system programming including MVT/HASP and online systems. MVS experience helpful. Supervisory experience of a minimum of 5 system programmers required.

Send resume establishing qualifications, full employment and earnings history, and salary requirements to Kenneth R. Logan.

The Rand Corporation
1700 Main Street
Santa Monica, CA 90406
An Affirmative Action Employer

Opportunities in Colorado

Supervisor Equipment Operations:

Supervise computer equipment operations and data preparation area; also responsible for physical planning for computer equipment. Directly supervising staff of 16.

Supervisor Technical Support: Supervise technical support unit of 7 people. Responsible for systems software and hardware-software resource management.

Data Base Analyst: Must have IMS experience on 370/V5 with minimum 5 yrs. systems and programming background. Duties include maintenance of Data Base and UCC-TEN Data Dictionary.

DP Education Coordinator: Must have minimum 5 yrs. EDP education experience with technical knowledge of education materials and presentation techniques. Will administer EDP Education and Standards Program for staff of 100.

Send resume in confidence to:



700 Broadway
Denver, Colorado 80273
An affirmative action, equal opportunity employer m/f

DISCOVER NCR

TERMINAL SYSTEMS DIVISION-DAYTON DAYTON, OHIO

Come and join Terminal Systems Division - Dayton. Our Engineering Staff is a leader in the design and implementation of Financial Terminal Systems. We have much to offer you — a career opportunity, a quality environment in which to work and live, and exceptional personal benefits. Dayton, Ohio is a progressive midwestern area, small enough to be friendly but large enough to offer outstanding communities with excellent housing, educational facilities, and cultural activities.

PROGRAMMER /SYSTEMS ANALYST

Knowledge in the area of microprocessors and mini-computers based on real-time operating systems.

participate in the design and implementation of mini and micro based realtime operating systems in a distributive network.

SOFTWARE SYSTEMS DESIGN

Provide technical expertise and leadership in the areas of realtime terminal control and batch operating systems.

Analysts for state-of-the-art design in terminal operating systems and to provide technical leadership in software architecture.

SYSTEMS ENGINEERS

Requires the development of concepts and specifications for new systems for financial terminal systems.

Requires the ability to analyze and participate in hardware and software development programs.

Basic educational qualifications for these positions are a BS or MS in EE, CS or Math and 2 to 7 years experience.

Join our winning team. Submit your resume and salary requirements to:

Robert L. Opalek
Employment Department
Terminal Systems Division-Dayton
NCR Corporation
Dayton, Ohio 45479

An Equal Opportunity Employer

NCR

position announcements

position announcements

position announcements

position announcements

position announcements

Just Out! The New

1977 Computer Salary Survey

and Career Planning Guide

Call for your FREE copy today!

Source Edp's 1977 Computer Salary Survey is now available. This authoritative and up-to-the-minute report will allow you to compare your compensation directly with professionals across the country performing the same duties you perform. It also examines in detail the strategies and techniques thousands of successful computer professionals have used to enhance their careers. After fifteen years of recruiting experience, Source Edp knows how you can gain broader professional exposure, maximize your compensation and break into management. It's all in Source Edp's 1977 Computer Salary Survey and career planning guide.

For your FREE copy, call the Source Edp office nearest you.

East		South/Southwest	
Boston	617/237-3120	Atlanta	404/325-8370
Greenwich	203/869-5977	Dallas	214/387-1600
New York/		Denver	303/773-3700
New Jersey	201/687-8700	Fort Worth	817/338-9300
Philadelphia	215/665-1717	Houston	713/626-8705
Washington, D.C.	703/790-5610	New Orleans	504/561-6000
Midwest		West Coast	
Chicago	312/782-0857	Irvine, Ca.	714/833-1730
Oak Brook, Ill.	312/986-0422	Los Angeles	213/386-5500
Cleveland	216/771-2070	Palo Alto	415/328-7155
Detroit	313/352-6520	San Francisco	415/434-2410
Kansas City, Mo.	816/474-3393	Torrance, Ca.	213/540-7500
Minneapolis	612/544-3600		
St. Louis	314/862-3800		

source edp

If unable to call, write:
Source Edp
Department C-2
721 Enterprise
Oak Brook, Illinois 60521

(When writing, please be sure to indicate home address and current position title.)

**SYSTEMS ANALYSTS
PROGRAMMERS ANALYSTS**
Do you have experience in DBMS (design, programming, administration, maintenance, etc.) with related experience of two or more years in one or more of the following:

PDP/11 (RSTS/E)
Mini Computer Systems
Project Management Experience
Timesharing Systems
Application Programming/Design
If so, we would like to hear from you.

We are a medium-size computer company specializing in several areas of data processing sales and service. We are in the market for a senior level person who is knowledgeable in the DBMS area and who is self-motivated, wants a challenging career and the opportunity for advancement based on performance, with an expanding company. BASIC, DIBOL and FORTRAN languages a definite plus. All replies held in strict confidence. Forward resume and salary history to:

CW Box 4869
797 Washington Street
Newton, Mass. 02160

EDP Auditor

Flowers Industries, Inc., a Diversified Food Firm, has an opening for an EDP Auditor—with outstanding opportunities for management within Audit Department and Corporate Organization. Preferred candidates will have a degree in accounting and 1-3 years experience as an EDP Auditor or in the Systems Development environment. Travel 30-50%, salary range \$15 to \$18 per year commensurate with qualifications. Please submit resume and salary history in complete confidence to Earl A. Quigg, P.O. Box 1338, Thomasville, GA 31792.

PROGRAMMER/ ANALYST

This growth oriented, multi-divisional leader in its field is looking for programmer/analysts with 3+ yrs exp with IBM DOS COBOL or Fortran for financial and marketing applications. \$20,000. FEE PAID

**ROBERT HALF
PERSONNEL AGENCIES**
522 Fifth Avenue
New York, NY 10036
(212) 221-6500

DATA PROCESSING

Major Atlanta Holding Corporation has positions available in DP subsidiary. Minimum 2 years experience in each position. Lead Communications Systems Programmer. Supervisory experience with large communications networks in OS/CICS environment.

Senior Communications Systems Programmer. Experience with large network problem diagnostics in an OS environment. CICS and HASP RJE experience a plus.

Technical Writer. EDP systems experience to analyze technical data in systems specifications and to document standards and procedures.

Excellent salary opportunities and benefits. Mail resume with salary history to:

CW Box 4875
797 Washington St.
Newton, Mass. 02160

SENIOR PROGRAMMER ANALYSTS OUTSTANDING CAREER OPPORTUNITY

A position is currently open for a Programmer Analyst with a strong PL/1 programming background in an O.S. environment. Applicants should be capable of performing all phases of Data Processing from problem definition/analysis through programming/implementation.

Experience in file maintenance and techniques associated with large customer related files would be helpful, but is not essential.

Advancement possibilities are almost unlimited for an individual with proven skills who is strongly motivated to further his career. Company's \$30 million sales and 30% annual growth rate add up to unusual opportunities. Good starting salary plus liberal program of Company paid benefits.

Our rural Danbury Connecticut location provides an attractive blend of suburban living and recreational activities, coupled with a close proximity to the metropolitan New York area.

Interested candidates are invited to send a confidential resume including salary requirements to:

Charles W. Brandenburg
Processing Center Manager
14 Finance Drive
Danbury, Connecticut 06810

SENIOR PROGRAMMER ANALYST

WE ARE: a leading manufacturer of packaging, industrial and specialty papers and a division of the world leader in fine writing papers. All our facilities are located in northeastern Wisconsin, a high quality of life area.

WE NEED: an aggressive, creative, team oriented individual to assume program development and system design responsibilities in our manufacturing and financial areas. The ideal candidate has 3 years COBOL programming and DOS/VS experience with a related Bachelor's degree.

WE OFFER: an opportunity to make an immediate contribution plus long range growth. Respond with salary requirements to: M.B. MAUDSLEY.

Thilmany

THILMANY PULP & PAPER CO.
Division of Hammermill Paper Co.
KAUKAUNA, WISCONSIN 54130

An Equal Opportunity Employer M/F

SYSTEMS ANALYSTS APPLICATION PROGRAMMERS SYSTEMS (SOFTWARE) PROGRAMMERS

All levels of experience, including Project Managers. Starting salaries \$13,500 to \$26,000.

Companies pay all fees & expenses.

Resumes published under code numbers—no names. Our client firms are located nationwide and are engaged in every type business.

FREE—EDP OPPORTUNITIES BULLETIN, a representative list of our DP career opportunities, mailed free of charge upon request (HOME ADDRESS ONLY).

For further information on these and other positions, send your resume in strict confidence to:

Mark Fuller
Cadillac Associates, Inc.
32 W. Randolph St.
Chicago, IL 60601
(312) 346-9400

SYSTEMS

Expansion of our Point-of-Sale Systems Division

National Semiconductor has established itself as a leader in the rapidly growing electronic point-of-sale systems business. We are developing micro computer terminals tied to in-store multi-processor minicomputers. These in turn are connected via telecommunication links to IBM 370 host computers. Our continuing growth in this market has created many opportunities for programmers and system support representatives. If you are a self-starter and are results-oriented, we want to hear from you.

Software Development Programmers

We have positions immediately available from the entry level through management for systems development professionals. These positions are based in our corporate offices on the San Francisco peninsula. Experience should be in one or more of the following:

- Communications systems - IBM 370 and minicomputer.
- Minicomputer operating systems, languages and development tools.
- Systems applications - POS, energy management, labor scheduling, etc.
- POS terminal applications programming
- Test and diagnostics for factory, field service.
- Product test, documentation, distribution and support.

These positions are available nationally. When responding please list your area of preference.

For confidential consideration, please forward your detailed resume or summary sheet to Mike Hawkins, National Semiconductor Corporation, 2900 Semiconductor Drive, Santa Clara, California 95051, or call TOLL FREE (800) 638-1915. We are an equal opportunity affirmative action employer male and female.

Systems Support Representatives

Will aid in the installation of key entry and scanning Datachecker supermarket systems. As systems support representative you will be responsible for the following:

- Coordination of key entry or scanning store installations.
- Installation and support of communication software.
- Customer training on Datachecker functions and operations.
- Customer training and consultation on in-store application language.
- Installation and support of in-store application packages.



**National
Semiconductor**
SYSTEMS DIVISION

DIRECTOR OF MANAGEMENT INFORMATION SYSTEMS

Central N.J. community college seeks qualified candidates for the position of Director of Management Information Systems. The Director is responsible for all administrative, instructional, student personnel, and external agency data processing functions of the Computer Center and supervises 9 professional and 5 technical staff members.

The College now maintains an IBM 360/40 environment, with a new installation contemplated, and augmented by a PDP 11/45. The administrative objective is to develop a base of management information which can be used in operational, control, and planning activities.

Candidates must possess a Bachelor's degree in business, computer science or other applicable field; Master's, or equivalent in graduate education and experience preferred.

Applicant must possess minimum of 6 yrs. experience in computing field, 3 yrs in management of computing activities. Familiarity with DBMS applications and prior experience in academic institutions desirable. Salary to \$24K. Position available immediately.

Send letter of application and resume including salary history, references, and curriculum by Jan. 31, 1977 to:

CW Box 4864
797 Washington St.
Newton, Mass. 02160

Equal Opportunity/Affirmative Action Employer

DATA PROCESSING MANAGER

NORTHERN CALIFORNIA

McClatchy newspapers, a multi-plant group of newspapers with radio and television stations, has challenging position at corporate level in Sacramento for data processing manager with strong experience and supervisory background. Should have minimum two years supervisory experience in medium sized DF shop with 3rd generation equipment. Good salary plus liberal vacation, medical and retirement benefits. All replies held in strict confidence. Send detailed resume including availability for personal interview to:

Personnel Department
McClatchy Newspapers
21st & Q
Sacramento, California 95813

An Equal Opportunity Employer

BUY SELL SWAP

**FORSYTHE
McARTHUR ASSOCIATES, INC.**

**IBM Computer
Dealer &
Lessor**

919 North Michigan Avenue, Chicago, Illinois 60611
312-943-3770 Telex 255161
Member, Computer Dealers Association

buy sell swap

COMDISCO

The World's Largest IBM Computer Dealer

SELLING

3168KJ-Feb. 3155J2-Feb.
3158K-Mar. 3165KJ-Feb.

LEASING

2065I-24 mo.-Feb.
3155K2-36 mo.-Feb.

BUYING

3145 3158 3165

WRITE:

Comdisco, Inc.
9701 W. Higgins Rd.
Rosemont, IL 60018

CALL:

(312) 698-3000
East: (201) 568-9666
West: (415) 944-1111

TWX 910-253-1233

Member Computer Dealers Association

COMDISCO

COMDISCO

buy sell swap

WANTED

BURROUGHS
L's
TC's

Ken Wilson
Wilson Business Machines
24293 Telegraph
Southfield, MI 48034
(313) 353-2600

buy sell swap

370/125's

For Sale* Lease* Purchase
*Purchase Leaseback

Specialists in 125 Systems

CB

CORPORATE
COMPUTERS, INC.

(203) 661-1500

115 Mason St., Greenwich, CT 06830

Member CDA

buy sell swap

BUY SELL LEASE

SYSTEM/3

Models 8, 10, 15
1403, 5421, 5445
3741, 5496, 9610

COMPUTER BROKERS, INC.

P.O. BOX 28298
Memphis, Tn. 38128
Phone 901/372-2622

buy sell swap

FOR SALE

(2) 3340 - B2
(1) 3525 - P3
(1) 3411 - 3
(1) 3410 - 3

Call Jeff Klein or Ed Joseph

IPS

IPS Computer
Marketing Corp.
467 Sylvan Ave.
Englewood Cliffs,
N.J. 07632
(201) 871-4200

buy sell swap

DEC BUYERS

WORD PROCESSING
FROM DIGITAL AT A
\$3,000.00 SAVINGS
(WS100-AA for \$16,800)
CALL LEN WHITACRE
(714) 994-4971
DPD
6980 ARAGON CIRCLE, No. 8
BUENA PARK, CA 90620

SYSTEM/3

1130 360/20

BUY • SELL • LEASE

For a prompt, competitive quotation on your IBM needs, call or write today.

ECONOCOM

ECONOMIC COMPUTER SALES, INC.
1255 Lynnfield Road P.O. Box 17825
Memphis Tenn 38117 (901) 767-9130
TWX 810-591-1205

Member Computer Dealers Association

WANTED

DEC PDP11 Series Peripherals
2, RP 03 Disc Drives with RP11
Disc Controller
2, RP04 Disc Drives with controller
1, LP11 300 line per minute printer or its equivalent
1, DH-11AD Multiplexor or equivalent
1, TM11 or TJU16 mag tape drive with controller
Also MF11 Parity core memory, 11/40 CPU's. Will consider purchase of complete systems.
Please call or write: Mr. Henry Lam
Quantum Informtaion Resources Ltd.
Suite 2080, Place du Canada,
Montreal, Quebec, Canada
(514) 878-1741

FOR LEASE

Available 3-1-77
370/135 GF #61928

Features;
1421, 3900, 4655,
4670, 4672, 6981,
7861, 8637

Power Unit
Console Printer

3340 - A2
3340 - B2

RALPH GRAVES
214/630-6700

RAM

Pioneer Computer Marketing
1165 Empire Central Place
Dallas, Texas 75247

BUYING

N.C.R. PHASE-OUT EQUIPMENT-
31, 32 and 441's
41, 42 and 43 BANK MACHINES AS WELL AS 151 and
152 ADDING MACHINES. ALSO 299 and 399 MINICOMPUTERS
BURROUGHS F-5000/6000 SERIES, L SERIES and 10-10-380 & 10-10-360
TELLER MODELS. FRIEDEN 5005 COMPUTYPER
Also A Supplier of SELECT-USED Equipment From: BURROUGHS • I.B.M. • PHILIPS
BUYING OR SELLING - CALL US FIRST!

KEY-EXIMPORT CORP.

256 LIVINGSTON ST. (P.O. BOX 129) NORTHVALE, N.J. 07647
TELEX: 135149 CABLE: KEYEXIMP-NORTHVALE NJ

TELE. N.J.
(201) 767-3444
N.Y.C. DIRECT LINE
(212) 736-7736

WANT TO BUY

4650 ISC

1435 5th Channel

For 370/158

AMG EQUIPMENT SERVICES INC.

99 Wall Street New York, N.Y. 10005

(212) 747-0670

FOR SALE

Immediate Delivery Available

Basic Four Model 400

48K, 3 Disk Drives
3 CRT's
3 Printers
(212) 541-8454
John Watson

FOR SALE

March '77

Delivery position on
IBM 370/138

Model J

Contact Eagle
(415)493-4000,
Ext 3798

FOR SALE

DEC EQUIPMENT

• 340 system w/2-VT05's
• 330 system w/2-VT05's
• 310 system
• Additional VT05's
• Centronics 101 printer

CrossComp

CrossComp Computer Systems
3824 50th Street
Lubbock, Texas 79413
(806) 792-3785

CHUCK NEWMAN'S

sale of the week

CHECK THESE PRICES

DATA 100/ ODEC PRINTERS

Model

Speed (LPM)

OEM List Price

NCE Price

DESK TOP UNITS

1422 125 4144 2500

1423 250 4665 2950

FLOOR MODELS

2422 125 4479 2700

2423-80 210 5000 2800

2423 250 5000 3100

WHISPER QUIET OPTION

Add \$300.00 to 14XX models.

\$160.00 for 24XX models. Call for details

INTERFACES (NEW) FOR

PDP11 & PDP8 \$ 675

Nova/DCC116 700

Interdata & RS232c 750

NEWMAN COMPUTER EXCHANGE

1250 N. Main St. Ann Arbor, Mi. 48104

(313) 994-3200

offers:

unlimited income to
360/370 leasing pros

CSA, an acknowledged leader in the computer leasing industry, is experiencing rapid growth. In conjunction with this growth, CSA has immediate requirements for outstanding, experienced 360/370 leasing and remarketing professionals.

CSA offers an excellent package. A liberal, progressive commission plan offers Unlimited Income Potential. Base salary is commensurate with your experience and proven abilities.

This is an outstanding opportunity to participate in the present and future growth of a major computer equipment lessor.

Interested parties should forward their resumes to:

Computer Systems
of America, Inc.

V.W. Garrett, Sr.V.P.
141 Milk Street
Boston, MA 02109
(617) 482-4671

**ONE DAY
SHIPMENT!**
FROM
AMERICAN
USED COMPUTER

**ONE DAY
SHIPMENT!**

FROM
AMERICAN
USED COMPUTER

buy sell swap

THE PRICE IS RIGHT! FOR SALE-360/40

TYPE	MODEL OR FEATURE NO.	DESCRIPTION	SERIAL NO.
2040	GOO	Central Processor	22067
	3237	Decimal Arithmetic	
	3274	Direct Control	
	4457	1401/1440/1460 Compat.	
	4460	1401/1440/1460 DOS Compat.	
	6980	Selector Channel 1st	
	6981	Selector Channel 2nd	
	7520	Storage Protection	
	7920	1052 Attachment	
1052	007	Typewriter Keyboard	59225

Located at Comma Corp. - Dallas Texas Available Immediately
Maintenance Qualifications: IBM Qualified

 Data Automation Company, Inc.
4858 Cash Road, Dallas, TX 75247
(214) 637-6570

buy sell swap

FOR SALE
Immediately Available
370/135-GF
#61485
IFA — 3330
IPA
1st Sel. Channel
1st Inc. Control Storage
UCS with
3215 & 3046

Also Have Available
370/138 & 148
(on/order positions)

RALPH GRAVES
214/630-6700


Pioneer Computer Marketing
1165 Empire Central Place
Dallas, Texas 75247

buy sell swap

Call us "Doc"
(Data Options Corporation)

We have the prescription for all your IBM computer hardware needs.

1. We are specialists in brokering leases and sub-leases.
2. We will lease or sub-lease your IBM 370 for 6 months to 7 years or fill your EQUIPMENT NEEDS on a lease or sub-lease basis and sale or purchase.
3. We will buy your 138/148 delivery position.

Available immediately:
a. 3158 3 MEG 1 year sub-lease
b. 3155 2 MEG with DAT- for 5 month sub-lease

 DATA OPTIONS CORPORATION

Call Us!
(914) 723-3800
Station Plaza
250 E. Hartsdale Ave.
Hartsdale, N.Y. 10530

buy sell swap

I.O.A. is now LEASING IBM Series I

We are now taking applications for LEASES on the new IBM Series I, mini-computer, on order equipment available.

Call or Write:
Marty Gutter or Roger J. Foti

 **I.O.A. Data Corp.**
383 Lafayette St., N.Y. 10003
(212) 673-9300
Member Computer Dealers Assoc.

DISKS FOR SALE

5 3330 Model 1 26K
5 3330 Model 11 52K
5 3333 Model 1 32K

Available in February

Contact Bill Hetzel
(919) 942-4121

INDUSTRIAL CONTROL COMPUTER WITH FREE EDP SOFTWARE

Optimum Configuration For:

- Message Switching
- Process Control
- Numerical Control

DEC PDP-11/40
PDP 11/34 Equiv.

Immediate Delivery
If you can act fast

Contact: Pete Melvin
At 890-9393

 **INTELLIGENT SYSTEMS**
460 Totten Pond Road,
Waltham, MA 02154
(617) 890-9393

FOR SALE

1975 IBM System 32 Model 33-B,
32000 bytes core storage, 9 mil-
lion bytes disk storage 155 lines
per minute printer, Diskette off
line storage, 48 character print
chain, 6 line CRT Display, Key-
board for entering jobs or data.
RPG II Compiler, Disk sort, data
file utility, Standard Systems
Control Program Utilities.
Ideal for batch processing of pay-
ables, receivables, general ledger,
payroll.
Printer can accommodate changes
to different forms as needed.
Written bids accepted — reply to
Box 628, Marietta, Ohio 45750.

370/158

Buy - Sell - Lease
First Quarter Deliveries
Call Dave Tait

 **IPS Computer Marketing Corp.**
467 Sylvan Ave.
Englewood Cliffs,
N.J. 07632
(201) 871-4200

A New Service For The Used Computer Marketplace

COMPUTER EQUIPMENT INFORMATION BUREAU

FOR BUYERS: CEIB is a free, up-to-date source on current used equipment offerings that's as close as your telephone. Our equipment file includes over 5685 current listings from numerous brokers, dealers, and private sellers. Just call (617) 247-2290 to obtain immediate information on any specific systems or items you're interested in — including seller's names, asking prices, and availability dates.

FOR SELLERS: CEIB is an inexpensive, convenient approach to reaching potential buyers. If you haven't already received our brochure and listing forms, please write or call ---

CEIB — P.O. Box 163; Boston, MA 02117 — (617) 247-2290
R. Ferrara, President

dataserv

INVENTORY SALE

Thank you for your business in 1976!

Call us for a quotation on any IBM equipment

Dataserv Equipment, Inc.
9901 Wayzata Boulevard
P.O. Box 9488
Minneapolis MN 55440
Toll Free
800/328-2406
612/544-0335

Product	Description	Qty	Two year lease	Three year lease	Four year lease/purchase	Outright sales price
Disk drives						
Memorex	2311 compat	1	\$ 30	\$ 20	\$.8	\$ 300
IBM 2311-1	Disk drives	2	40	30	13	500
2314-01	1x9 system W/2 Channel switch	2	745	575	515	19,900
2314-A1	1x9 system W/2 Channel switch	7	1,120	870	775	29,900
2319-B1	1x6 system W/2 Channel switch	1	1,120	870	775	29,900
2319-B2	3 spindles only	2	280	230	206	8,000
2313-A1	4 spindles only	1	28	230	206	8,000
2312-A1	1 spindle only	1	N/A	N/A	52	2,000
3340-B2	Disk storage	1	699	555	495	19,000
Telex 2314	1x3 system W/2 Channel switch	1	605	425	336	13,000
Telex 2314	1x6 system W/Channel switch	1	N/A	N/A	516	20,000
Tape drives						
2401-1	One drive, 9TR 30KB	2	\$ 23	\$ 16	\$ 13	\$ 500
2402-1	Two drives, 9TR 30KB	2	47	33	26	1,000
2401-3	One drive, 9TR 90KB	4	93	65	52	2,000
2401-3	One drive, 7TR 90KB	9	27	19	16	600
2403-1	CTLR, one drive 30KB	2	396	294	245	9,500
2403-2	CTLR, one drive, 60KB	2	466	327	260	10,000
2404-2	Syms CTLR, one drive 60KB	1	466	327	260	10,000
3410-2	Tape unit, dual density	1	N/A	N/A	212	8,200
3410-3	Tape unit, dual density	2	N/A	N/A	260	10,000
3411-3	Tape & CTLR, dual density	1	N/A	N/A	520	20,000
Card readers/punchers & controllers						
2520-B1	Card read/punch	1	\$ 6525	556	\$ 542	\$21,000
2540-01	1000 CPM reader/punch	1	N/A	621	645	25,000
2821-1	Printer, 2540 CTLR	1	838	654	645	25,000
2821-2	Printer, CTLR	1	N/A	539	595	23,000
2821-5	2-printer, 2540 CTLR	1	1,398	1,226	1,110	40,000
Printers						
1403-2	800 LPM	3	\$ 326	\$ 262	\$ 253	\$ 9,800
1443-N1	CTLR and printer	2	513	425	381	14,750
CPUs & Memory						
2025-E0	48K CPU w/features 4590, 4595, 4427, 5248, 7520 and 1052 console	1	\$ 5135	360	\$ 310	\$12,000
2030-FE	96K CPU w/features 3237, 3895, 4427, 4456, 5856, 6960, 7520, 7915 and 1051/1052 console	1	652	491	413	16,000
2040-G	128K CPU w/features 3237, 4427, 6980, 6981, 7520, 7920, and 1052 console	1	1,864	1,472	1,290	50,000
2040-H	256K CPU w/features 3237, 4427, 6980, 6981, 7520, 7920 and 1052 console	1	2,796	2,126	1,806	70,000
360/40 IBM memory	128K and wall frame for 128-256K upgrade	1	792	621	542	21,000
2050-H	256K processor w/features 2 selector channels and 1052 console	1	5,592	4,251	3,615	140,000
2050-I	512K processor w/features 3 selector channels and 1052 console	1	6,990	5,232	4,386	170,000
360/50	Fabritek memory 128K	1	419	327	291	11,250
370/115	160K CPU w/features 3910, 4653, 4104, 4457, 4460, 4650, 4670, 4675, 8070, 9771, 9800	1	3,540	3,106	2,838	110,000
360/65	I-H upgrade		559	392	310	12,000
Miscellaneous & features						
2040 feature 4457 1401	Compatibility	1	\$ 1635	114	\$ 91	\$ 3,500
2050 feature 6982 - 3rd channel		1	466	392	387	15,000
1416-1	Print trains	6	42	33	31	1,200

buy sell swap

buy sell swap

buy sell swap

buy sell swap

buy sell swap



WHEN
BUYING OR SELLING
COMPUTER EQUIPMENT

FOR SALE

Available Now
2-3330-1's
2803-2 & 2420-7's

Available Jan.
370/155J With
AMS Memory & PSU

U.S.

Home Office
New York
Chicago
Dallas
San Francisco

T.A. Takash
Dick Ventola
Pete Ahern
M.W. "Bill" Tucke
Henry Patulson

(602) 248-6037
(914) 949-1515
(312) 298-3910
(214) 233-1818
(415) 283-8980

International

Canada
U.K.
Europe
Mexico
Austro-Asia

Don Maunder (Toronto)
Bruce Pearson (London)
Joe Gold (Geneva)
Andres Contreras
Don Haworth

(416) 366-1513
(01) 759-9191
(022) 61-27-54
(905) 543-6850
(214) 233-1818

Non-IBM

Dallas

John Hallmark

(214) 233-1818

Greyhound Computer Corporation Greyhound Tower Phoenix, Arizona 85077

FOR SALE
BURROUGHS B3500
120 KB Core Memory
800 lpm Line Printer
(2) 800 BPI-9-Tr Tapes
800 CPM Card Reader
20M Bytes Disk (20 ms)
Ernie Lucken
Diversified Computer
Applications
2525 E. Bayshore Road
Palo Alto, Calif. 94303
(415) 324-2523

FOR SALE OR LEASE - 360/20

2020	DO2	Central Processor	30692
	7495	Storage Control	
	8082	2203 Attachment	
	8099	2560 Attachment	
2203	A01	350 LPM Printer	20090
	5558	24 Additional Print Positions	
	1903	52 Additional Print Positions	
2560	A01	M F C M	10437
2311	011	Disk Drives	17785
2311	011	Disk Drives	30383

Located: Portland, Oregon Available: January 10, 1977
Maintenance Qualification: IBM Qualified

Call or Write:
 Data Automation Co., Inc., P.O. Box 47922
Dallas, Texas 75247 - Phone (214) 637-6570
We would like to be your Computer Company.

FOR SALE
EASY LOAD 1 CARTRIDGES
(slightly used-new style-white)
\$.90 each
EASY LOAD 1 CARTRIDGES
(grey color-Memorex-used)
\$.70 each
MMI will pay freight on orders of
1000 or more.
Call Collect:
Bill Lissau or Warren Todd
Magnetic Media, Inc.
Tulsa, Oklahoma
(918) 664-2255

FOR SALE
158 MEMORY
Available February 1, 1977
J to JI (1 to 1 1/2 MB)
JI to K (1 1/2 to 2MB)
K to KJ (2 to 3 MB)
Call Dave Tait
 IPS Computer
Marketing Corp.
467 Sylvan Ave.
Englewood Cliffs,
N.J. 07632
(201) 871-4200

TERMINALS
DATA ENTRY EQUIPMENT

KEYPUNCH SALE
026 \$995.00
D29 \$1495.00
029 \$1995.00

DATA RENTALS/SALES INC.
2919 S. LaCienega Blvd
Culver City, Calif.
(213) 559-3822

IBM UNIT RECORD EQUIPMENT			
MACH.	SALE	LEASE	MACH. SALE LEASE
024	\$250	\$17/Mo.	082 \$850 \$35/Mo.
026	\$800	\$30/Mo.	083 \$1850 \$60/Mo.
029	\$1900	\$50/Mo.	084 \$2300 \$100/Mo.
046	\$1200	\$50/Mo.	085 \$1100 \$60/Mo.
047	\$1500	\$60/Mo.	088 \$2500 \$175/Mo.
056	\$175	\$15/Mo.	089 \$1300 \$50/Mo.
059	\$1800	\$50/Mo.	402 \$800 \$60/Mo.
063	\$750	\$30/Mo.	403 \$900 \$70/Mo.
077	\$350	\$25/Mo.	407 \$1200 \$80/Mo.
			1401 \$10500 \$400/Mo. System

THOMAS COMPUTER CORPORATION
600 N. McClurg Court - Suite 4202
Chicago, Illinois 60611
(312) 944-1401

SELL • BUY
TELETYPE
Models 32-33 New, Used
Telex • TWX/DDD
BRPE'S
NATIONAL
TELETYPEWRITER CORP.
207 Newtown Rd.
Plainview, N.Y. 11803
(516) 293-0444

BUY LEASE SELL
370/115 - 370/125
 ECONOCOM
ECONOMIC COMPUTER SALES, INC.
P.O. Box 17825/Memphis, Tennessee 38117
(901) 767-9130
 Member: Computer Dealers Association

370/155 DAT
S/N 10463
Sale or Lease
Available for
Immediate Delivery
With or Without Memory
Call Ted Molinari
 IPS Computer
Marketing Corp.
467 Sylvan Ave.
Englewood Cliffs,
N.J. 07632
(201) 871-4200

DEC
OEM's & End Users
C.D. SMITH
Broker In New & Used
DEC Data Systems
310 & 350 Series
Available
4151 Southwest Freeway
Suite #130
Houston, Texas 77027
(713) 965-0874

WANTED

BURROUGHS
L3000, L5000, L8000
TC700, TC 3500

NCR
31-32-41-42-43-152

IBM
360, 370 System 3 & 32

FRIDEN
Flexowriters All models

IOA
I.O.A. Data Corp.
383 Lafayette St., N.Y. 10003
(212) 673-9300
Member Computer Dealers Assoc.

IBM 059-02
"Liquidation Sale"
Eligible for IBM M/A
Refurbished
Immediate Delivery
Purchase \$1500
Lease \$40
Lease/Purchase \$52
Call While They Last!
Jim Carleton
CMI CORPORATION
23000 Mack Avenue
St. Clair Shores, MI 48080
(313) 774-9500

**BUY-SELL
TRADE**
For Computer
Call Action Write
CAC
P.O. Box 80572
404/458-4425 Atlanta, Ga. 30366

WANTED
ALL 360 AND 370 SYSTEMS
AND PERIPHERALS
WE BUY • SELL • LEASE • TRADE
 transdata
Member Computer Dealers Association
P.O. Box 47762 Dallas, Texas 75247 PHONE (214) 631-5647

370/138 & 370/148
54% OF IBM
On an 84 Month Net Lease
Next available machines ship in
APRIL
Call Ed Joseph (138) or Rick Thiele (148)
 IPS IPS Computer Marketing Corp.
467 Sylvan Avenue
Englewood Cliffs, N.J. 07632
(201) 871-4200

3158
AVAILABLE
MARCH, 1977
FOR LEASE
4 to 7 YEAR TERM

3138/3148
TNCC WILL PURCHASE
YOUR ON ORDER
DELIVERY POSITION
370/155-II-DAT
2 Megs AMS MEMORY
AVAILABLE FOR SALE OR LEASE
IN FEBRUARY
LEASE RATE IS LESS THAN
IBM 148 TLP RATE

THOMAS NATIONWIDE COMPUTER CORPORATION
Brian M. Battle — (312) 944-1401
600 North McClurg Court - Suite 4202A
Chicago, Illinois 60611
Paul Nortman — (516) 752-1000
1 Huntington Quadrangle - Suite 4S13
Huntington Station, New York 11746

**RSTS
SYSTEM**
11-40
3 RP03s
2 TU10s
IMMEDIATE DELIVERY
Contact: David Orr
(606) 278-0411

WANTED
IBM 3420 Model 6
TAPES
• 3803/2 Controller also needed
• Need prior to 02/20/77
• Will consider IBM rental credit
machines being returned to
IBM Interested sellers
please call or write
**FORSYTHE
McARTHUR**
 919 N. Michigan Ave
Chicago, IL. 60611
(312) 943-3770 Telex: 25-5161

WANTED
DAT for 370/165
Used or New Order
Position
Contact: Ted Moulder
AMG Equipment Services, Inc.
(212) 747-0670 (800) 221-2674

buy sell swap

buy sell swap

buy sell swap

buy sell swap

buy sell swap

Before you buy or lease... take a second look

**BUY-SELL-LEASE**

360/30 — 360/40 — 360/50 — 360/65

IBM PERIPHERALS

370/135	370/145	370/155	370/165
370/138	370/148	370/158	370/168

ANY CONFIGURATION
COMPUTER INDUSTRIES INC.

 3570 American Drive • Atlanta, Georgia 30366
 404/451-1895 • TWX 810/757-3654

 CHICAGO — 312/295-2030
WASHINGTON — 202/466-2470
LOS ANGELES — 213/370-4844
LOOK!**WANT TO PURCHASE**
 370/360 Peripheral Equipment
 3330-3340-3803-3420-1403N1

 Will Consider Your Purchase Options
 We Are the Texas Good Guys With
 the White Hats

DATA AUTOMATION COMPANY, INC.
 4858 Cash Road, Dallas, TX 75247
 (214) 637-6570
**165 5 CHANNELS**
SALE OR LEASE
 Available March 77

 Fred Hughes
 Bill Pomeroy
 Charlie Berry

 (315) 425-1900
 Telex: 93-7435

CIS Corp.
 600 Mony Plaza
 Syracuse, N.Y. 13202
ITEL WANTS TO**BUY:** 370/158
SELL: 360/50I, 40H, 40G, 30F, 30E
 1/2 360/65 MP
 135 IBM Memory (96K-192K)
 ITEL 2314 Dual Density Disk Drives
 2841's, 2314-A1's
 2401's — all models

CONTACT: Linda Vaughn or Reenie McCarthy
 ITEL Computer Products Division
 One Embarcadero Center
 San Francisco, California 94111
 (415) 983-0220, (415) 983-0238

Elspath Arden
 ITEL International
 London, England
 (441) 235-2495

ITEL
 CORPORATION
360/40 System
 Sale or Lease
 With Full I/O Set
 Tape & Disk Drives

Call Jeff Klein


IPS Computer Marketing Corp.
 467 Sylvan Ave.
 Englewood Cliffs,
 N.J. 07632
 (201) 871-4200

For Sale or Lease

DISK PACKS

IBM-5440	\$35.00
IBM-2315	\$25.00
IBM-1316	\$25.00
IBM-2316	\$65.00
IBM-3336-1	\$140.00
IBM-3336-11	\$175.00


Data Automation Co. Inc.
 4858 Cash Road
 Dallas, TX 75247
 (214) 637-6570
**For Sale 1419-1**
 on or off-line
 dual addressing

February Availability

 Call: MBR Computer Corp.
 313 East Norman Ln.
 Wheeling, IL 60090
 (312) 537-0970

PDP 11/70

For Sale

FEB. Availability

128K core

FP11c

RP04 (dual controller)

DH11

LA36 console


SOLUTIONS INCORPORATED

 915 Grain Exchange
 Minneapolis, MN 55415
 (612) 371-3888
IBM 3288 PRINTERS AVAILABLE

- 120 LPM Printer for 3270 System
- Delivery Immediate
- 3 and 4 Year Leases

CALL

TERMINAL LEASING CO.
 A Partnership between
 Comdisco, Inc.

 (312) 698-3000 and
 Forsythe/McArthur Associates, Inc.
 (312) 943-3770

"3270 Leasing is Our Business"

FOR LEASE**IBM 370/135 DH**

Available March, 1977 for any term up to 40 months.

Includes 3215, 3046 and features 3274, 3900, 4640, 4722, 6981, 6982, 7861, 7855.

CONTACT

J.E. Nevens

 Brenco Automation Center, Inc.
 2222 Grand Avenue
 Des Moines, Iowa 50312
 (515) 283-2415
360/65J

S/N 60773

Sale or Lease

 Available February 5
 With 2860-3 & 2870-1

Call Dick Absher


IPS Computer Marketing Corp.
 467 Sylvan Ave.
 Englewood Cliffs,
 N.J. 07632
 (201) 871-4200
**BUYING SELLING LEASING**

360/40	370/145	370/135
360/50	370/158	370/155
360/65	370/168	370/165

TAPES / DISKS / CORE

Pioneer Computer Marketing
1165 Empire Central Place
Dallas, Texas 75247

214/630-6700

NORTHWEST CRT SALE

C&L Terminals is celebrating the grand opening of an expanded Portland center and a new Seattle branch. Regularly \$1245, Lear-Siegler's rugged 24-line ADM-3 is available for only

\$1060

Until February 15

 Call Now (503) 244-7538 Portland
 (206) 454-1180 Bellevue
 (800) 547-4423 Western U.S.

C&L Terminals

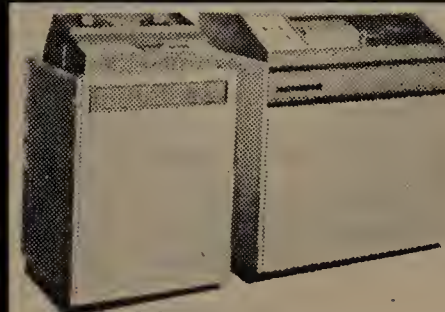
*The Full-Service
 Terminal Distributor*
MINI COMPUTERS

Buying, Selling? Let us do the work for you and save you time and money!

AVAILABLE NOW:

Novas — most models — new & used; DEC 11s & 8s; Printers, disc drives; CRTs, etc.

WANTED

 DEC & DGC Systems, CPUs & peripherals.
 Buyers waiting for 8Es & 8Ms.
MINI COMPUTER EXCHANGE
 (408) 733-4400
 TWX 910-339-9272
AMERICAN USED COMPUTER CORPORATION
**1403N-1
 SPEED
 AT 20%
 OF THE
 COST!**

 A COMPLETE FACTORY REFURBISHED
 OFF-LINE DATA PRODUCTS 1333 LPM
 PRINTER WITH TAPE DRIVE
 MAINTENANCE AVAILABLE!
\$9500**IN STOCK NOW****IBM**
360/40 H
2 CHANNEL

- 1443-N1
- 2314-1 2 CHANNEL SWITCH
- CALCOMP 345A...IBM 3420-5 TYPE 1 X 4 TAPE SUBSYSTEM
- 2401-4/2803-2 1 X 4 TAPE SUBSYSTEM \$17,000

617-261-1100
 Member:
 Computer Dealers
 Association

PO Box 68, Kenmore Station, Boston, MA 02215

buy sell swap

FOR SALE

360/65 J

2860-3, 2870-1

ALL IBM MEMORY.
We will also LEASE
for 36 Month period.

Call or write
Roger J. Foti
or Bob Hogan

IOA

I.O.A. Data Corp.

383 Lafayette St., N.Y.10003

(212) 673-9300

Member Computer Dealers Assoc.

buy sell swap

370

115-125-135

Buy-Sell-
Lease-Trade

Call Mike Vargo
(313) 774-9500

Nation's
Leader In Small
Systems

360/20

Call Bob Southwell
(313) 774-9500

S/3

Components &
Systems

Call Jerry Roberts
(313) 774-9500

1130

Call Jim Carleton
(313) 774-9500

buy sell swap

3270 CRT'S

For Sale or Lease
We Want to Buy
CRT's, Printers & Controllers
Call Bill Graham
(313) 774-9500

360/50

360/40

360/30

We Buy and Sell Any 360 System
or Peripherals. Before you buy or
sell, get your most competitive
offer from CMI.

Call Boh Van Heilemont
(313) 774-9500

3420's 3803's

3333's 3830's

3330's

SALE OR LEASE
ALL MODELS

Call Darryl Hastings
(313) 774-9500

buy sell swap

370/145-158

BUY-SELL-LEASE

Call Ron Baker
(313) 774-9500

IBM 129 Users

We Want to Buy Rental
Credit Machines
Lease Back
Plans Available

BUY-SELL-LEASE

129 029 059 026

IBM Manufactured

082 083 514

Call Jim Carleton
(313) 774-9500

IN CANADA

IBM 360 370
System/3
Buy-Sell-Lease

Call Don DuPuis
CMI Company
P.O. Box 893
Windsor, Ont. n9A6P2
(519) 258-8910

buy sell swap

IBM UNIT RECORD
EQUIPMENT

024 077 085 402 514 552 026
082 087 403 519 557 029 083
088 407 523 602 056 084 089
408 548 604 029 129
We Buy Sell or Lease
360s 1400s 1440s

IBM COMPUTERS

2040 GF, I/O Set
5 Spindle Calcomp 2314
6-60KB Tape Drives/Sims

Big Savings — up to 50% on
Short Term Rentals

Call us for all your needs: we buy
rent and sell all types of IBM unit
record equipment. Over 12 years
of serving commercial and govern-
ment requirements. All equip-
ment rebuilt at our own factory
and guaranteed for IBM Mainte-
nance. Contact ACS for proposal.

7126 Mullins
Houston TX 77036
(713) 666-2122
TWX 910-881-1526

ACS

EQUIPMENT CORP.

buy sell swap

370/145-12

S/N 11400

Sale or Lease

Available February 1
With ISC

Call Rick Thiele

IPS Computer
Marketing Corp.

467 Sylvan Ave.

Englewood Cliffs,
N.J. 07632

(201) 871-4200

buy sell swap

FOR SALE
OR LEASE

I/O SET
with two 1403N1
printers

Contact: Harry Blair
Computer Installations Corp.
(713) 524-1401

buy sell swap

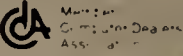
CMI

Computer Marketers International

23000 Mack Ave., St. Clair Shores, Mi. 48080

313/774-9500

THE IBM DEALER



ENTREPRENEURS
COMPUTER SHACK

Personal computers are the world's newest, most exciting and the
fastest-growing business. Computer Shack, our turn-key computer
franchise network, lets you get in at the ground floor. Unlimited
potential. Complete training program.

Personal microcomputers are sold to business, science, education, the
professions, as well as the explosively growing hobbyist market.
Computer Shacks offer microcomputers, modules, tools, books, acces-
sories; provide equipment assembly and testing. Each store has a
traffic-building Game Room. Choice locations available.

Call or write:
Ed Faber, President

Computer Shack, Inc.
14860 Wicks Blvd.
San Leandro, CA 94577
(415) 895-9363

RETURNING EQUIPMENT
TO IBM?

- Please call FMA
- Your return freight bill paid by
FMA
- Other incentive offered
- 3340's, 3330's, 3420's &
3277's needed

FORSYTHE
McARTHUR

 919 N. Michigan Ave.
Chicago, IL 60611
(312) 943-3770 Telex: 25-5161

FOR SALE

NCR Century 100
Computer
System with:

32K Memory
Dual Disc Unit
750 CPM Card Reader-Punch
450/900 Line Printer
I/O Writer
Paper Tape Input
15 Line Multiplexor

Contact: G.H. Wolf
Purchasing Agent
City of Hollywood
P.O. Box 2207
Hollywood, Fla. 33022
(305) 921-3221

FOR SALE
IBM UNIT
RECORD
EQUIPMENT

024	\$175
026	\$750
047	\$850
056	\$50
059	\$1,650
077	\$100
082	\$650
083	\$1,650
084	\$2,250
084 Alpha	\$3,250
085	\$475
088-2	\$1,700
088-1	\$2,475
108	\$990
402	\$300
403	\$500
514	\$250
519	\$750
526	\$900
548	\$1,650
552	\$1,000
557	\$2,250

 Data Automation Co. Inc.
4858 Cash Road
Dallas, TX 75247
(214) 637-6570

Now Randolph has 2 hot lines!

The S/370 hot line.

800-243-5307

WE WANT TO BUY

☐ 138/148 on-order positions

☐ 135/145 subleases

RANDOLPH COMPUTER COMPANY

The S/360 hot line.

800-243-5308

WE WANT TO BUY

☐ 3420-3's

☐ 3420-5's

537 Steamboat Road Greenwich, Connecticut 06830

buy sell swap	buy sell swap	buy sell swap	buy sell swap	time & services
---------------	---------------	---------------	---------------	-----------------

BUY — SELL — LEASE — BROKERAGE
Let the
"NATIONS LARGEST WHOLESALE DEALER"
Buy, sell, lease, sub-lease, or be your agent in placement of your pre-owned IBM 360/370/System 3, or other units
COMPUTER INTERNATIONAL, LTD.
CWC's international division —
experts in foreign markets, freight, customs
BEACH COMPUTER CORPORATION, CWC's Leasing Division
COMPUTER WHOLESALE CORP., (504) 581-7741
SUITE 507/508 FIRST NATIONAL BANK OF COMMERCE BLDG.
NEW ORLEANS, LOUISIANA 70112
 MEMBER OF COMPUTER DEALERS ASSOCIATION

**IBM 2260
COMPATIBLE
TERMINALS**
**IMMEDIATE DELIVERY
REDUCED PRICE**
USED AND RECONDITIONED, READY FOR IMMEDIATE OPERATION. WRITE OR CALL ED LAWLER AT:
 Woodhaven Industrial Park
Cornwells Heights, PA 19020
Phone (215) 639-9400
TWX 510-667-1650

**370/158
MP**
**FOR SALE
OR
LEASE**
**Computer
Marketing Inc.**
7704 Seminole Ave.
Melrose Park, PA 19126
(215) 635-6112
Contact: Bernie Gest

**PLANNING TO
SEND IT BACK?**
Call Us First For IBM 370 Mainframes on MAC or T1 P — Also Buying Order Positions
CONTACT: Ted Moulder
A.M.G. EQUIPMENT SERVICES, INC.
99 Wall St. New York, N.Y. 10005
(212) 747-0670 (800) 221-2674

dataserv
buy • sell • lease • trade

360	370	System/3	Peripherals
360/30	370/115	5410	Disks
360/40	370/125	5415	Tapes
360/50	370/135	Sys/32	Printers
360/65	370/145 +	Peripherals	Card I/O

Call our "quotation hot-line"
Toll free **800/328-2406** / or 612/544-0335
Or write: Dataserv Equipment, Inc., 9901 Wayzata Blvd, P.O. Box 9488, Minneapolis MN 55440

dearborn
dearborn giveth NOW 2050-H (2-chan.); 2050-1 (3-chan.); 2314/2319 (1x6); 2520-B2 punch; 2501-B2 card reader; 2671/2822 paper tape.
dearborn giveth SOON 2314-A1 (1x4) avail. 3/15/77; 2314/2319 (1x6); 2821-5 control unit; 2540; two, 1403-N1's, all avail. 4/15/77.
dearborn taketh away your 3420's and 3803's, all models. Contact Tom Millunchick (312) 671-4410.
 dearborn computer leasing company
4849 n. scott st., schiller park, IL 60176
chicago (312) 671-4410 • toronto (416) 621-7060 st. louis (314) 727-7277

**JAMES
COMPUTER CO.**
BUY/SELL/LEASE/TRADE
**— SPECIAL SALE —
IBM UNIT RECORD EQUIP.**
We Buy Rental Credit Equip.
IBM 029's & 129's - All models
Your source for guaranteed equipment
James Computer Co.
4970 Marine Drive / Chicago, Illinois 60640
Natalie Reyes (312) 271-3311
(312) 728-6871

WANTED
3420's 3803's
3333's 3830's
3330's
PCM will purchase
your installed
disk's or tapes that
have maximum
rental credits
214/630-6700

Pioneer Computer Marketing
1165 Empire Central Place
Dallas, Texas 75247

**IBM EQUIPMENT
FOR LEASE**

024	\$10/Month
026	\$30/Month
077	\$15/Month
082	\$25/Month
083	\$55/Month
088-1	\$150/Month
088-2	\$100/Month
402	\$25/Month
403	\$30/Month
407	\$40/Month
419	\$25/Month
514	\$35/Month
519	\$50/Month
526	\$60/Month
548	\$75/Month
552	\$45/Month
557	\$100/Month

1401-C06 System Complete with
Tapes & Disks \$1,000/Month.
7330 Tape Drives \$25/Month
 Data Automation Co. Inc.
4858 Cash Road
Dallas, TX 75247
(214) 637-6570 

**3420-6
Tape
System**
Sale or Lease
2 Controller &
14 Drive System
6250/1600 BPI
2 X 16 Switch
2 Channel Switch
Available February 1
Call Ed Joseph
 IPS Computer
Marketing Corp.
467 Sylvan Ave.
Englewood Cliffs,
N.J. 07632
(201) 871-4200

**Datacenter
370/158**
3 meg VS2
Specializing in
Remote Job Entry
and Batch
Excellent Technical Support
Very Attractive Rates
Contact: Stu Kerievsky
(212) 564-3030
Datamor
132 W. 31st St.
New York, N.Y. 10001

Prime Time Available
360/50 - 256K
5/2314 - 4/180KB
Call: (212) 725-5775
Infologic
444 Park Ave. So. (30St)
New York 10016

**COMPUTER SERVICES
AVAILABLE**
System/3
Mod. 15B
Disk/Tape/
High Speed Printer/BSCA
Systems Design and Consulting
Computer Rental
Disk-to-Tape Backup
Discounts Available on Block Rentals.
For Further Information Call:
(617) 723-7300
(Ask for Computer Rental)
H.C. Wainwright & Co.
One Boston Place
Boston, Ma. 02108

**Computer Time
Available**
360-40-256K • 360-40-128K
360-40-128K • 360-30-128K
(18) 2401 180K.B.
(18) 2314 Disk Drives
(4) 1100 L.P.M. Printers
Babbage Systems, Inc.
345 Park Ave. N.Y.
Contact: George Kay
(212) 688-1111

**Computer Time
Available**
370/145 512K
DOS/VS - Power V/S
8-3330, 2-120KB Tapes
Attractive Bulk Rates
Route 95
Central R.I, Area
C.W. McKellar
(401) 886-2220

**TIME &
SERVICES**
I.B.M.-360's
All shifts available on
4 - 360 computers with all
features, 2314's, 2311's,
2402's - 800 BPI 9 TRK,
2 4 0 2 's - 7 T R K,
2401's - 1600 BPI 9 TRK,
1403's - N1, 2540's, 2703
with ASYN & BISYNC
Port.
Prices start at \$35.00 per
hour. We also offer com-
plete Batch and Tele-pro-
cessing services. Configu-
ration can be modified to
accommodate any 360 com-
puter user. We have on site
CE's.
UCS Computer Centers
Richard Mine Road
Wharton, N.J. 07885
Contact Bill Kersey at
(201) 361-4007
or
Joe Kelly at
(201) 361-4008

**SAN FRANCISCO BAY AREA
370/158 TIME**
STAND-ALONE AND BATCH
• 2 meg VS1
• IMS
• 3330, 3350 DASD
• On-line programming
• Competitive rates
Contact Dave Normington at
(415) 692-3960
H.A.S.
1633 Bayshore
Burlingame CA

**COMPUTER TIME
AVAILABLE
IBM 360-30**
6 2314's, 6 2401's, 800 BPI, 2540
Card Reader, 1403 N1 Printer
with UCS, 128 K Core under DOS
and Power. Two Shifts Per Day
Available.
Contact:
Gerry Chalmers
MMS, Inc.
5 Heron Drive
Bridgeport, NJ
(609) 467-3600

time & services

Need good turnaround,
sophisticated system & support?

WANG HAS IT!

- on its IBM 370/158 VS, HASP
- 24 hours a day, 7 days a week
- full local and remote services
- 6250/1600/800 bpi tapes
- 3350, 3300, and 2314 disks
- RJE/WYLBUR
- IMS, CICS, DATACOM
- language processors and utilities
- full customer support

Contact John Donahue

"SERVICE THROUGH EXPERIENCE"

WANG

LABORATORIES, INC.
DATA CENTER DIVISION

20 SOUTH AVE., BURLINGTON, MA. 01803, TEL. (617) 272-8550

time & services

Retrieve
Sales/Use Tax rates
automatically
with

SALESTAX

Many firms avoid costly tax assessments and save valuable staff time too, with . . .

SALESTAX
the magnetic tape file of all Sales/Use Tax Rates. Updated monthly. For free brochure call or write:

VERTEX SYSTEMS Inc.
an MAI company
650 Park Avenue
King of Prussia, PA 19406
215-337-0500

software for sale



Move up to

ACCOUNTING IV.

General Ledger and Financial Reporting

Accounts Payable

Accounts Receivable

Three fully integrated financial application systems, proved during years of successful use. Totally ANS COBOL. Call or write today for details.

informatics inc.

World's Largest in Software Products

65 Route 4, River Edge, NJ 07661

New York: (212) 564-1258
New Jersey: (201) 488-2100
Chicago: (312) 325-5960
Los Angeles: (213) 887-9040
Massachusetts: (617) 481-1180
Philadelphia: (215) 265-7448
Sacramento: (916) 961-1881
Stamford, CT: (203) 357-7924
Dallas: (214) 750-0800

software for sale

Q-PAC Payroll

Mightiest System of All



- Comprehensive tax module
- Customized personnel processing
- Most flexible report writer
- Powerful general ledger interface

Other financial systems:
General Ledger
Accounts Payable
Accounts Receivable

SOFTWARE INTERNATIONAL
Elm Square, Andover, Mass. 01810
(617) 475-5040

SOFTWARE FOR SALE

ROUTE ACCOUNTING SYSTEMS

SPECIALIZED SYSTEMS

- * Distribution Processing — Sales Order & Invoice Processing
- * Route Settlement — Route Load & Invoice Analysis
- * Sales Analysis — Customer or Route History & Forecast
- * Fleet Maintenance — Distribution Cost Analysis

ACCOUNTING SYSTEMS

- * Payroll and Personnel
- * Financial Accounting
- * Accounts Payable
- * Accounts Receivable

MARCHBANKS & PARKER, INC.
4538 Centerview Drive.
San Antonio, Texas 78228

HOTEL SOFTWARE
for
DATA GENERAL NOVA
complete
FRONT DESK & BACK OFFICE SYS.

MARITIME DATA INC.
(804) 853-7661
chuck young dir/mar

InSci Human Resource System

Expanded EEO Compliance System

Benefits Statement System ERISA

Expanded OSHA System

Expanded Career Profiling System

Expanded Career Profiling System

General Retrieval System

Career Profile

Personnel and Employment

Continuous Employment

Attendance Option

Position Control Option

Other Services:
Needs Analysis
Custom Design
Database Programs
EEO Consulting
Seminars

Payroll

In 1976 MSA'S General Ledger/FICS System helped our clients keep track of more money than The U.S. Mint printed in the last 15 years.

If you'd like to find out how this system can help you in asset management, profit planning, cost and general accounting, call Marge Kimbrough at (404) 262-2376 or send us this coupon.

MSA

THE FINANCIAL SOFTWARE COMPANY

Management Science America, Inc.
3445 Peachtree Road, N.E.
Suite 1300
Atlanta, Georgia 30326
(404) 262-2376

Chicago 312-986-2450;
Los Angeles 213-822-9766;
New York 201-871-4700

MMS
Accounts Payable-II
Keeps The Well
From Going Dry!

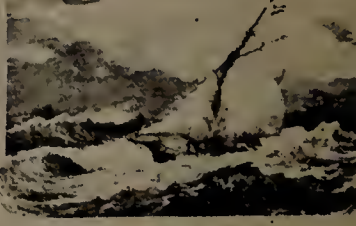
Exclusive features:

- Data base design — all COBOL
- Complete vendor financial history
- Cash commitments by date in detail and summary
- Duplicate vendor invoice control

Other financial systems:
Accounts Receivable
General Ledger
Payroll

SOFTWARE INTERNATIONAL
Elm Square, Andover, Ma. 01810
(617) 475-5040

Weather the Stormy Seventies with MMS GENERAL LEDGER



- Maximizes Internal Control
- Strengthens Cash Management
- Provides Most Reliable Forecasting

Other Financial Systems:
Accounts Receivable
Accounts Payable
Payroll/Personnel

SOFTWARE INTERNATIONAL
Elm Square, Andover, Mass. 01810
(617) 475-5040

Now for Payroll

A user-controlled system -- up and running fast.

- wide-scope processing
- table-driven
- 999 different earnings, taxes, deductions
- labor distribution module
- powerful retrieval
- comprehensive documentation manuals
- fully supported implementation
- integrated with Human Resource System

Please send me information on InSci Payroll!

Frank Cancro, Vice President

InSci

Information Science Incorporated
Dept. CW-B
95 Chestnut Ridge Road
Montvale, New Jersey 07645
201-391-1600

Name: _____

Title: _____

Company: _____

Address: _____

Phone number: _____

NAME _____

COMPANY _____

TITLE _____

ADDRESS _____

CITY _____

STATE _____ ZIP _____

PHONE _____ COMPUTER MODEL _____

I am interested in:

- ☐ General Ledger
- ☐ Personnel Management and Reporting
- ☐ Payroll Accounting
- ☐ ALIAX™
- ☐ Supplies Inventory Control and Purchasing
- ☐ Accounts Receivable
- ☐ Accounts Payable
- ☐ Financial Information and Control
- ☐ Fixed Asset/Property Accounting

Whether you're buying, selling, swapping, hiring or looking, Computerworld's Classifieds work.

Issue Date: Ad closing is every Friday, 10 days prior to issue date.

Sections: Please be sure to specify the section you want: Time and Services, Software for Sale, Position Announcements and Buy/Sell/ Swap. (Available upon request: Software Wanted, Turnkey Systems and Real Estate.)

Copy: We'll typeset your ad at no extra charge. Please attach CLEAN typewritten copy.

Cost: Our rates are \$49.70 per column inch. Minimum and size is two column inches and costs \$99.40 per insertion. Extra space is available in half-inch increments and costs \$24.85. Box numbers are \$1.00 extra.

Billing: If you're a first-time advertiser, we must have your payment in advance.

Ad Size: _____ Issue (Date(s)): _____ Section: _____

Signature _____

Name: _____

Company: _____ Title: _____

Address: _____ Tel: _____

Send this form to: Pam Palmer, Classified Advertising,
or Kathy Steinberg, Position Announcements
COMPUTERWORLD, 797 Washington St., Newton, Mass. 02160

FXCM: N=NEW YORK; A=AMERICAN; P=PHILADELPHIA-WASH
I=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
D-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Now, Intel rents memory for IBM 370/125.

Save up to 50% on additional memory for your IBM 370/125. You can do it now with a call to your Intel representative. We're now delivering add-on memory for the 370/125. And we give you three money-saving choices: 30 day rental, long term leases or outright purchase.

Until now you had only one choice: IBM. Our Model 7125 meets or exceeds all their specifications, with equal access and cycle times. Just plug it in. It's totally compatible with all your hardware and software. So why pay more?

Our exclusive 16K bit memory chip provides system expansion up to one megabyte in a small desk high unit. Active spare memory enables you to substitute failing memory in 32K byte increments. Maintenance features include comprehensive error checking and correction logic, automatic memory address relocation and a fault location system that enables chip replacement.

Intel is the established leader and largest

manufacturer of semiconductor memory. Our add-on memory systems for the 370/125, 370/135, 370/145, 370/158, 370/168 and, soon, 370/115, 370/138 and 370/148, enables you to add more memory, in less

space and at lower cost. Start saving now. Replace your IBM memory with Intel memory. Remember us when you need to add even more.



Intel Memory Systems
1302 North Mathilda Avenue
Sunnyvale, California 94086

Please send me more information on the following
Intel memory systems:

- | | |
|--------------------------------------|--|
| ☐ IBM 370/125 | ☐ IBM 370/135 |
| ☐ IBM 370/145 | ☐ IBM 370/158 |
| ☐ IBM 370/168 | ☐ IBM 370/_____ |

Name/Title _____
Company _____ Mail Station _____
Address _____ Phone _____
City/State/Zip _____

intel[®] memory systems
A DIVISION OF INTEL CORPORATION